

MUSC Pump Station Upfit
Charleston County, South Carolina

Environmental Assessment

U.S. Army Corps of Engineers
Charleston District



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TABLE OF ACRONYMS

APE	Area of Potential Effects
BOW	South Carolina Department of Environmental Services, Bureau of Water
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resource System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DO	Dissolved Oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FM	Force Main
FMC	Fishery Management Councils
FMP	Fisheries Management Plan
FONSI	Finding of No Significant Impact
GPM	Gallons Per Minute
HTRW	Hazardous, Toxic and Radioactive Waste
MBTA	Migratory Bird Treaty Act
MDTE	Medical District Tunnel Extension
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery and Conservation Management Act
MUSC	Medical University of South Carolina
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Services
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Units
PRD	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Services, Protected Resources Division
PS	Pump Station
SCCMP	South Carolina Coastal Management Program
SCDNR	South Carolina Department of Natural Resources
SCIAA	South Carolina Institute of Archaeology and Anthropology
SHPO	South Carolina State Historic Preservation Office
TDH	Total Dynamic Head
USACE	U.S. Department of the Army, Army Corps of Engineers
USFWS	U.S. Department of the Interior, Fish and Wildlife Services
VAMC	Ralph H. Johnson Department of Veterans Affairs Medical Center
WRDA	Water Resources Development Act

1 INTRODUCTION

1.1 DESCRIPTION OF DOCUMENT

This Environmental Assessment (EA) has been prepared by the U.S. Army Corps of Engineers (USACE), Charleston District, pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 – 4370f, and its implementing regulations, 40 C.F.R. §§ 1500 – 1508 and 33 C.F.R. Part 230, in coordination with Federal and state resource agencies, to evaluate alternatives and environmental impacts of upfitting the Medical University of South Carolina (MUSC) pump station (PS) in service of MUSC and broader Spring-Fishburne drainage basins in Charleston, South Carolina. To our knowledge, no previous EA has been created related to this project and original construction was done by MUSC. If the impacts are considered insignificant relevant to environmental concerns, a Finding of No Significant Impact (FONSI) would be issued.

1.2 PROJECT AUTHORIZATION

Section 219 of the Water Resource Development Act (WRDA) of 1992, Public Law 102-580, as amended, authorizes the Secretary to provide assistance to non-federal interests for carrying out water-related environmental infrastructure and resource protection and development projects. Such assistance may be in the form of technical and planning and design assistance. Section 5158 of the WRDA of 2007, Public Law 110-114, amended Section 219 of WRDA 1992 by adding the following project and authorized amount to Section 219(f): “(247) CHARLESTON, SOUTH CAROLINA.—\$4,000,000 for stormwater control measures and storm sewer improvements, Spring Street/Fishburne Street drainage project, Charleston, South Carolina.” The Construction Spend Plan—Addendum for the Bipartisan Infrastructure Law of 2022 (formerly the Infrastructure Investment and Jobs Act 2022)—allocated \$4,000,000 in appropriations for the “ENV INFRASTRUCTURE SPRING ST/FISHBURNE ST DRAINAGE, CHARLESTON, SC” to initiate the implementation of stormwater control measures and storm sewer improvements at the Spring Street/Fishburne Street drainage project in Charleston, South Carolina.

1.3 PROJECT LOCATION & DESCRIPTION

The MUSC PS is located in an industrial site at the northeast corner of the intersection of Bravo Street and Ralph H. Johnson Drive, adjacent to the MUSC Wellness Center and across the street from the Ralph H. Johnson Department of Veterans Affairs Medical Center (VAMC) in the Charleston peninsula of South Carolina (Figure 1). The PS was built in 2007 as part of hospital facility construction and was subsequently transferred to the City of Charleston to operate and maintain. The PS serves a 12.68-acre, highly developed and largely impervious drainage basin. The PS discharges to a 30-inch force main (FM) pipe that transitions to a 24-inch pipe, merges with other gravity flows, cuts across the VAMC campus, outlets into a box culvert under Lockwood Blvd, and discharges into the Ashley River on the south side of the Hilton Garden Inn. The MUSC Pump Station Service Area also connects directly to the Medical District Tunnel Extension (MDTE) (Ehrhardt Street) Service Area via a bi-directional 24-inch pipe at an outfall at the intersection of Doughty St. and Ehrhardt St. (Figure 2).

The pump station houses three Flygt channel impeller submersible pumps (model CP 3400/765). The originally installed pumps, with 480 mm impellers, included one pump with a capacity of 9,000 gallons per minute (GPM) at 65 ft total dynamic head (TDH) and two pumps with capacities of 12,000 GPM at 45 ft TDH. The pumps have been damaged by cavitation repeatedly through time and the impellers were replaced in 2012 and subsequently damaged again. The impellers were eventually shortened to 430 mm to reduce the potential for further damage. Following these alterations, the system capacity included one

pump of 12,900 GPM at 34 ft TDH and two pumps of 16,900 GPM at 55 ft TDH and a total discharge rate of approximately 18,400 GPM producing nearly 65 ft of TDH with all three pumps running. The PS is expected to come to the end of its intended design life and require rehabilitation and upgrades by 2025.

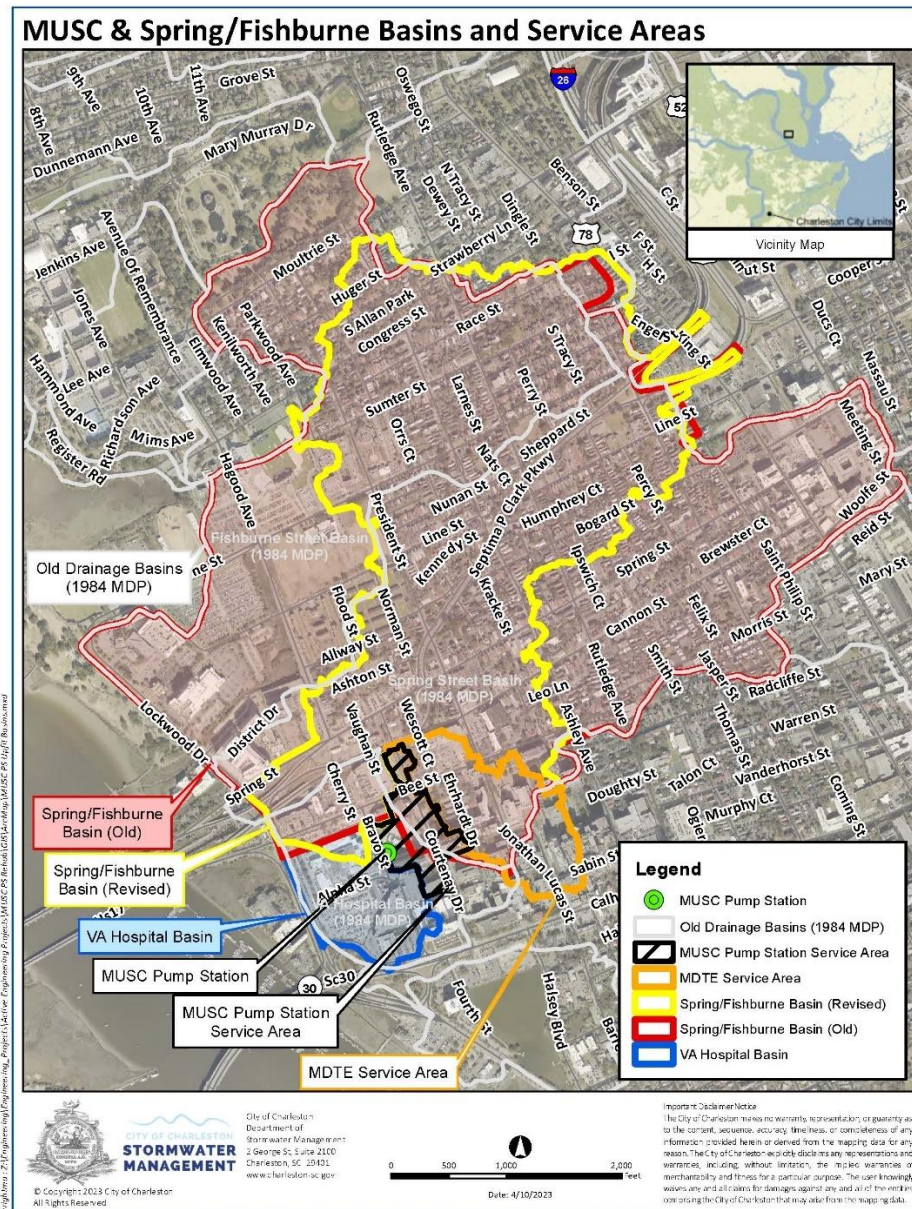


Figure 1 Regional location and local view of MUSC pump station location within Spring/Fishburne Basin

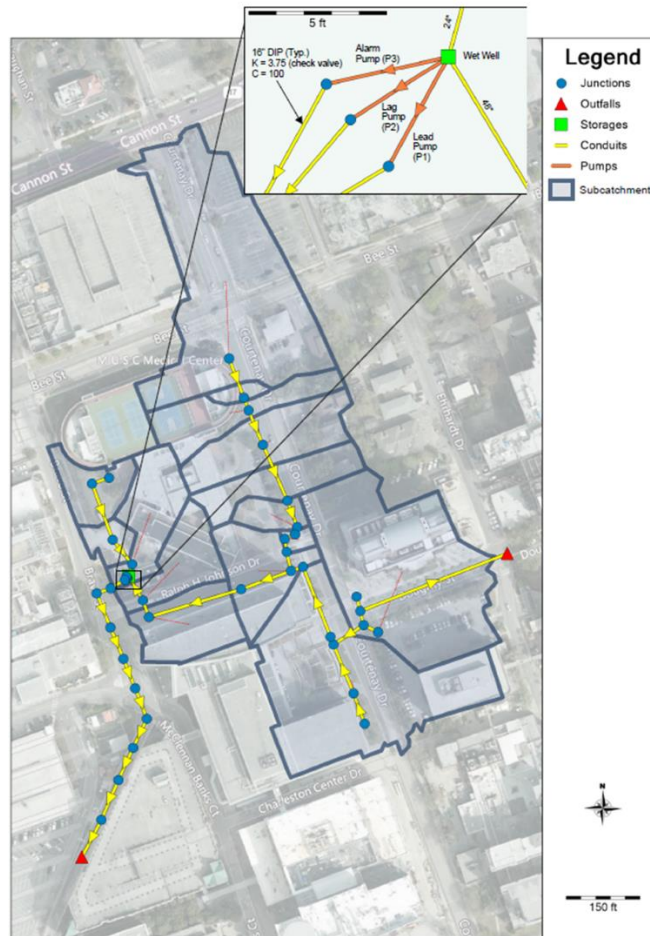


Figure 2 Junctions and outfalls contained within MUSC Pump Station Service Area

1.4 PURPOSE AND NEED FOR ACTION

The Charleston Medical District is located within the Spring Street/Fishburne Street drainage basin and includes MUSC, Ralph H. Johnson VAMC, and Roper Hospital. This area experiences severe and frequent flood events that have been documented, which cause the Medical District significant damage and limit access for emergency vehicles, residents, and employees. In 2019, the Medical District documented over \$23 million in flood-related damages.

The MUSC Pump Station Upfit Project will upfit a stormwater PS that is reaching the end of its design life. The upfit will be a complete rehabilitation of the electrical and mechanical components of the station to maintain function and improve resiliency, as well as complete additional upfit work to account for intensifying storms and sea level rise. The PS directly drains over 12 acres, including the primary Medical District Access roads of Courtenay Street, Bee Street, and Doughty Street.

This project is a top priority for the City of Charleston. The Medical District is one of its most flood-prone areas. Flooding in this location causes some of the worst impacts within the basin due to the effect on critical Medical District Access roads and hospital buildings. This portion of the basin is a topographic bowl where a regional low area traps water and results in sustained heavy street flooding up to 1.5 feet deep following a 10-year storm event, completely preventing even most high-water vehicles

from being able to access the hospitals. With an improved PS, modeling shows elimination of this flooding (Figure 3).

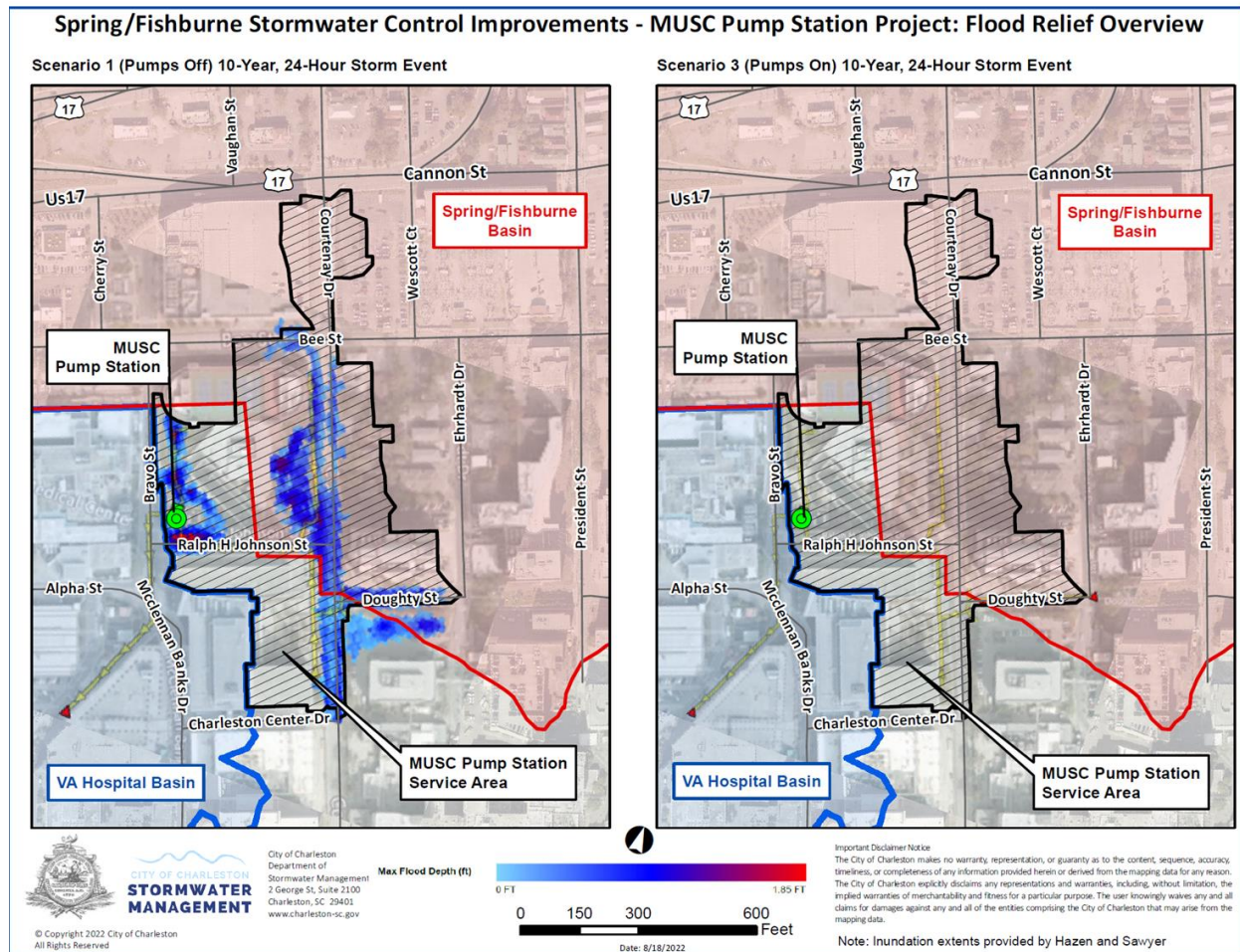


Figure 3 Engineering model of pump performance during a projected 10-year, 24-hour storm event

The bi-directional 24-inch pipe connecting the MUSC Pump Station Service Area and MDTE Service Area is also important as runoff may flow in either direction. The pipe was modeled as half-full at the upstream end, which drives runoff into the MUSC basin. During the peak of both 10-yr and 100-yr storms, the flow direction in the Doughty Street connector pipe reverses, allowing some runoff to backflow into the Ehrhardt basin. For most of the storm, flow is entering the basin at the upstream node and is pumped through the MUSC PS to the Ashley River outfall. The velocity reverses during the height of the storm, and excess runoff backflows into the Ehrhardt basin via the 24-inch connector pipe. During this brief period at the peak of the storm, the pumps cannot manage all of the incoming flow. Future potential upgrades could target improvements to the PS to manage flows during the peak of storm events.

The MDTE Service Area on Ehrhardt Street is directly connected with the broader Spring/Fishburne Basin where both are serviced by ongoing construction as part of the Spring St/Fishburne St Drainage Basin Project, including the Lockwood Drive Pump Station and the MDTE (Ehrhardt Street) Project. Therefore, utilizing state-of-the-art, modern flood reduction engineering and pump technology will ensure the most efficient stormwater management system for the Charleston Medical District and surrounding basins.

1.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

USACE has prepared this EA in compliance with NEPA and associated implementing regulations to evaluate the potential environmental effects of the alternatives considered herein to the following environmental resources:

- Air Quality and Noise
- Aquatic Resources and Water Quality
- Climate Change
- Coastal Zone Resources
- Cultural Resources
- Essential Fish Habitat
- Sediment
- Socioeconomics and Environmental Justice
- Terrestrial Biological Resources
- Threatened and Endangered Species

The following resources were eliminated from detailed analysis because they were not considered relevant or consequential as they relate to the actions outlined in each alternative (Table 1):

Table 1 Resources dismissed from detailed analysis

Resource	Rationale for Elimination
Aesthetics	The scope of potential effects to aesthetics is limited to addition of a rooftop on the pump station and would not contribute any meaningful impact.
Coastal Barrier Resources Systems	The action area does not overlap with any designated coastal barrier resource systems as identified under protections of the Coastal Barrier Resources Act (16 U.S.C. 55 § 3501 et seq).
Floodplains	Executive Order (EO) 11988 (<i>Floodplain Management</i>) states that Federal agencies shall avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, Federal agencies shall take action to reduce the risk of flood loss, and minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. The proposed action does not support development of the area and provides additional minimization of flood impacts. Therefore, no further consideration of this EO is considered herein.
Geological Resources	The geology of the proposed project area ¹ will remain unaffected under any alternative. No unique or noteworthy geological features will be permanently impacted.
Hazardous, Toxic, and Radioactive Waste	There are no hazardous, toxic and radioactive waste (HTRW) as defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) within the action area. The closest facility registered to the Resource Conservation and Recovery Act is the Ralph H. Johnson Veteran's Affairs Medical Center. This facility is a producer and handler of hazardous waste and pharmaceutical waste. However, there is no potential overlap between wastes associated with the facility and the actions herein.
Invasive Species	No invasive species have been identified within the project area of which propagation would be influenced by the actions herein.
Navigation	The proposed action would contribute to greater output capacity of stormwater at an outfall on the Ashley River which is used for navigation. However, this would have no effect on navigation.
Recreation	The area of effect would not overlap with any areas of potential recreation other than streets and roadways in the vicinity of the pump station. Impacts to this resource type would be of very little or no consequence.
Wild and Scenic Rivers	The Ashley River is only recognized under the South Carolina Scenic Rivers Act of 1989 (Title 49, Chapter 29 of the S.C. Code of Laws), and consists of a 24-mile segment from Sland's Bridge (US Highway 17-A) to the Mark Clark expressway (I-526) bridge. This area is far upstream of the action area.

1.6 RELATED ENVIRONMENTAL REVIEWS

Categorical Exclusion, Spring/Fishburne US 17 Route Drainage Improvements (SCDOT 2009). Provided documentation of fulfillment of NEPA regulations for initial construction related to broader Spring/Fishburne Drainage Basin Project.

¹ The "project area" is defined as the area of direct overlap with the spatial extent of proposed actions.

Environmental Assessment, Determinations and Compliance Findings for HUD-assisted Projects 24 C.F.R. Part 58, Ehrhardt Street Drainage Project (HUD 2021). This document provides a summary of environmental analyses related to the Medical District Tunnel Extension Project and was performed in fulfillment of NEPA regulations for project funding provided by U.S. Department of Housing and Urban Development.

2 ALTERNATIVES

Alternatives concerning USACE actions in implementation of this project were considered and evaluated based on compliance with environmental laws and regulations, compliance with executive orders, and impacts to the environment including those to air quality and noise, aquatic resources and water quality, climate change, coastal zone resources, cultural resources, sediment, socioeconomic and environmental justice, terrestrial biological resources, threatened and endangered species, cost effectiveness, engineering feasibility, and the ability of the alternative to meet the purpose and needs of the project. In reviewing alternatives, USACE considered whether they would be technically feasible (engineering); cost effective; and compliant with applicable environmental laws, regulations, and executive orders; and whether they would have less than significant environmental impacts. Only the Proposed Action Alternative was found to meet the criteria outlined above. A No Action Alternative, while it would not meet the purpose and need for action, was included in the evaluation to provide a baseline for environmental impacts, as required by NEPA.

No Action Alternative

Under the No Action Alternative, the proposed upfitting would not occur. This alternative would likely result in the repair/rehabilitation/replacement of the pump infrastructure through other means to combat potential stormwater events in the future. However, such efforts may be of a different spatial or temporal context and prolong the period of vulnerability of the City in offsetting impacts of heavy stormwater events or reduce the potential capacity to offset these potential impacts as Federal assistance by USACE would no longer be considered.

Proposed Action Alternative

Under the Proposed Action Alternative, USACE actions would include complete upfitting and rehabilitation of the MUSC pump station. Proposed improvements to the PS include increased pumping capacity, improved hydraulic configuration in the wet well and inflow chamber, enclosure and conditioning of the control room, and replacement and upgrade of electrical, instrumentation and controls, and lighting. At this time, several pump models are being evaluated with the highest capacity pumps being considered for installation resulting in an approximately two-fold increase in the rate of discharge from the system. Just upstream of the PS, the proposed project will include replacement or upsizing of two short inflow pipes at the wet well to improve inflow which has been compromised since initial construction.

3 EXISTING CONDITIONS

3.1 AIR QUALITY AND NOISE

Baseline noise levels within the action area² vary throughout the year from vehicular traffic, construction operations, recreation and social events, and naturally occurring noises (e.g., buzzing of insects, bird

² The “action area” is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

calls). Some noise associated with the use of drills, hydraulics, operation of heavy machinery, and high-velocity movement of water may be associated with the project.

Air quality in the area is affected by a variety of factors common in heavily developed urban areas, including emissions from vehicular traffic and residential, commercial and industrial ventilation systems. The use of heavy machinery and operation of the pumps to carry out project construction will create some localized emissions during project construction.

3.2 AQUATIC RESOURCES AND WATER QUALITY

The aquatic resources of the action area are tied directly to the nearby estuarine environment of the Ashley River and are greatly influenced by the tidal connection to the Charleston Harbor and to the anthropogenic contributions to water quality parameters. The Ashley River has relatively low freshwater flow and gradually decreases in both surface and bottom salinity in the upstream reaches, which contrasts strongly with the nearby Cooper River which shows more dramatic decreases in salinity (Van Dolah et al. 1990). The portion of the river within the action area is considered to be polyhaline with salinity around 20-25 ppt during both low tides and high tides and a tidal range of 1-3 ppt (Van Dolah et al. 1990). Dissolved oxygen (DO) levels in the Ashley River lower reaches are similar to other portions of the Harbor and nearby rivers averaging around 7 mg/l and decreasing along with saturation rate gradually upstream. There is also considerable seasonal variation in DO concentration and saturation in the area with highs of about 10 mg/l DO concentration and 90% saturation in winter and lows of 3 mg/l and 50% in summer months. Furthermore, the Ashley River has some of the highest turbidity levels of the waterways connected to the Charleston Harbor averaging at 12.8 nephelometric turbidity units (NTUs) and a range of 1.5 to 36 NTUs. These conditions throughout the river owe to high concentrations of nutrients and organic material from municipal sewage facilities and urban and rural runoff (Van Dolah et al. 1990). The Ashley River has the second largest number of industrial and commercial facilities in the region along its eastern shoreline and supports residential developments along much of its remaining shorelines. However, in the action area, effects to water quality from nutrient loading are relative to other portions of the basin and the Cooper and Wando River.

Of eleven water quality monitoring locations in the Lower Ashley River watershed, only three are of good quality, all located upstream of the action area (EPA 2024) (Figure 4). All other locations in the Lower Ashley River watershed upstream and downstream of action area are considered unsuitable for swimming and boating due to the presence of harmful bacteria (and other microbes), while some are also unsuitable for aquatic life and have poor oxygen levels. The neighboring Lower Cooper River watershed, just east of the Lower Ashley River watershed, also contains at least two impaired water quality monitoring locations closest to the action area, while at least two monitoring stations five or more miles from the outflow source in the action area report good quality water further into the Charleston Harbor.

One permitted discharger, Charleston Water System - Plum Island Wastewater Treatment Plant, is located downstream of the action area and contributes to water quality in the nearby Charleston Harbor. The facility has been cited for numerous violations and formal enforcement cases involving oil pollution prevention regulations.

No shellfish harvesting is permitted throughout the entirety of the Lower Ashley River watershed and Charleston Harbor due to high bacteria levels.

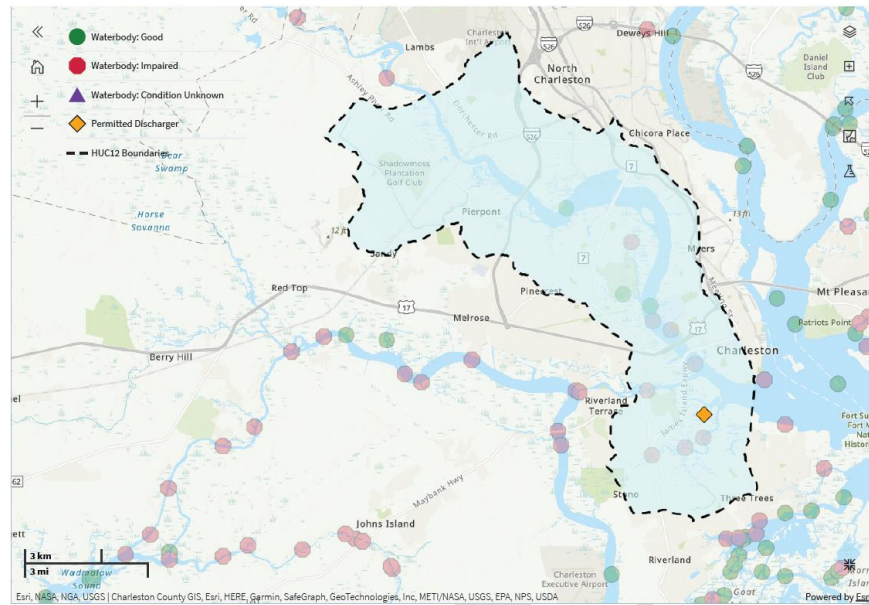


Figure 4 Waterbody sample locations for Lower Ashley River watershed (EPA 2023)

Plankton

Plankton generally consist of microscopic organisms of phytoplankton and zooplankton but can include larger species of crustaceans and jellyfish. At the mouth of the Ashley River, there are frequently relatively high levels of chlorophyll and dissolved organic carbon, along with other loading nutrients which contribute to eutrophic conditions (Van Dolah et al. 1990). Chlorophyll is an indicator of phytoplankton abundance, as these are unicellular plants, and they often consist of diatoms and cyanobacteria in southeastern estuaries and freshwater systems (Camburn et al. 1978; Davis and Van Dolah 1992; NOAA 1996). Phytoplankton typically peaks in mass during the winter and summer with particulate organic carbon in the Ashley River (Van Dolah et al 1990). This can lead to corresponding peaks in the abundance of zooplankton (Durbin et al. 2003).

Zooplankton in the Ashley River and elsewhere can be categorized based on size and position in food chains. The primary consumers of zooplankton consist of protists. Higher level zooplankton (i.e., mesozooplankton) consists of copepods and cladocerans, which in turn are consumed by macroplankton like fish larvae, amphipods and decapod crustaceans. These mesozooplankton and microzooplankton then support larval fish and crustaceans in estuarine spawning and nursery grounds (Ragotzkie 1959; Van Engel and Joseph 1968).

The patterns of abundance and distribution of plankton in the action area and elsewhere are influenced by several physical and biological factors. In estuarine habitats, these can include tidal forces, wind stress, bottom friction, buoyancy fluxes, predation pressures, light, salinity and temperatures among other factors (SCDNR 2020c).

Benthos

Benthic organisms in estuarine habitats such as the Ashley River are highly associated with levels of salinity and sediment types, but also show a high degree of natural variability in patterns of abundance and distribution (Van Dolah et al. 1990). Dominant benthic fauna in the Ashley River are generally mollusks, polychaetes, oligochaetes, nematodes, and amphipods (Van Dolah et al. 1990). Adjacent to the

action area, the dominant benthic fauna include the dwarf surf clam (*Mulinia lateralis*), *Paraprionospio pinnata* (polychaete) and *oligochaeta* (annelid worms).

Nekton

Nekton collectively refers to aquatic organisms capable of controlling their location through active movement and do not rely on the water current or tide for movement. Fish are the principal nektonic species although some crustaceans such as portunid crabs, penaeid shrimp and some mollusks, such as squid spend at least a portion of their life as nekton. A number of fish species are considered to be estuarine-dependent and utilize the coastal estuaries for at least a portion of their life cycle. Nektonic species commonly observed in the action area include white shrimp (*Penaeus setiferus*), American stardrum (*Stellifer lanceolatus*), Atlantic croaker (*Microporonia undulatus*), bay anchovy (*Anchoa mitchilli*), blackcheek tonguefish (*Symphurus plagiatus*), silver perch (*Bairdiella chrysoura*), weakfish (*Cynoscion regalis*), fringed flounder (*Etropus crossotus*), lesser blue crab (*Callinectes similis*), roughneck shrimp (*Trachypenaeus constrictus*), and hogchoker (*Trinectes maculatus*) (Knott and Martore 1991).

Essential Fish Habitat

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (P.L. 94-265) set forth new requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of federally managed fisheries.

EFH is defined in the MSA as “...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. § 1802(10)). The definition for EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each Fisheries Management Plan (FMP). Designated EFH for the action area includes intertidal flats, unconsolidated bottoms, estuarine emergent wetlands, oyster habitat, and estuarine and marine water column. Federally managed species known to occur within the action area are provided in Table 3 below. The action area includes Habitat Areas of Particular Concern for Coastal Inlets and Summer Flounder.

Table 2 Federally managed species for the South Atlantic that may occur within the action area

Common Name	Scientific Name	Jurisdiction	FMP ¹
Gag Grouper	<i>Mycteroperca microlepis</i>	SAFMC	Snapper Grouper
Gray Snapper	<i>Lutjanus griseus</i>	SAFMC	Snapper Grouper
Summer Flounder	<i>Paralichthys dentatus</i>	MAFMC	Summer Flounder
Bluefish	<i>Pomatomus saltatrix</i>	MAFMC	Bluefish
Blacktip Shark	<i>Carcharhinus limbatus</i>	NMFS	HMS
Tiger Shark	<i>Galeocerdo cuvier</i>	NMFS	HMS
Spinner Shark	<i>Carcharhinus brevipinna</i>	NMFS	HMS

¹Definitions for acronyms used include: SAFMC = South Atlantic Fishery Management Council, CMP = Coastal Migratory Pelagic, HMS = Highly Migratory Species, MAFMC = Mid-Atlantic Fishery Management Council, and FMP = Fishery Management Plan

Commercial Shellfish

Due to South Carolina Department of Environmental Services (SCDES) (formerly known as South Carolina Department of Health and Environmental Control) Water Quality Designations, commercial shellfish harvesting is prohibited in the Ashley River portion of the action area.

Wetlands

The action area has nearby tidal salt marshes along shorelines. In general, these marshes are larger in areas that are sheltered from winds and wave actions. The intertidal zone is an important nursery area for larvae and juveniles of many marine species and provides important refuge and foraging habitat for various invertebrates, and marine and shoreline birds.

These wetlands have a salinity range between 18 and 30 ppt and are characterized by smooth cordgrass and black rush. High marsh is limited in the action area, but typically includes sea oxeye, salt grass and salt meadow hay, along with estuarine scrub.

3.3 CLIMATE CHANGE

The climate in this region of South Carolina consists of long hot summers and cool winters. Summers are warm and humid (average July high and low temperatures are 92°F and 71°F, respectively), and winters are relatively mild (average January high and low temperatures are 58°F and 35°F, respectively). In general, the state has warmed by 0.5-1° (F) over the last century and the sea is rising about 1-1.5” every decade (EPA 2016). Precipitation occurs chiefly as rainfall and averages about 49.5”/year with approximately one-third of that total occurring during the months of June, July, and August.

It is expected that in the coming decades changing climate in South Carolina will lead to an increase in the number of unpleasantly hot days, an increase in heat related illness, an increase in inland flooding, a decrease in crop yields, and harm to livestock (EPA 2016). Sea level rise is the biggest climate change concern in the Charleston area. Due to sea level rise, there is an increased risk of coastal storm surge and potential damages to resources located in the project area.

3.4 COASTAL ZONE RESOURCES

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §1451 to §1466) was established as a national policy to preserve, protect, develop, and where possible, restore or enhance, the resources of the Nation’s coastal zone for current and future generations. The South Carolina Coastal Management Program was established per the CZMA and was authorized in 1977 under South Carolina’s Coastal Tidelands and Wetlands Act. The project area is within South Carolina’s designated Coastal Zone Management Area.

3.5 CULTURAL RESOURCES

The management of cultural resources is regulated under federal laws such as the National Historic Preservation Act (NHPA) of 1966 (54 U.S.C. § 300101 et seq.), the Archaeological and Historic Preservation Act of 1974 (54 U.S.C. §§ 312501- 312508), the American Indian Religious Freedom Act of 1978 (42 U.S.C. §§1996 and 1996a), the Archeological Resource Protection Act of 1979 (16 U.S.C. §§470aa-470mm), NEPA (42 U.S.C. §4321 et seq.), the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 U.S.C. §3001 et seq.), the Abandoned Shipwreck Act of 1987 (43 U.S.C. §§2101-2106), and the Sunken Military Craft Act of 2004 (10 U.S.C. § 113 et seq.).

Cultural resources considered in this study are those defined by the NHPA as properties listed, or eligible for listing, on the National Register of Historic Places (NRHP) and are referred to as historic properties. Historic properties include buildings, structures, sites, districts, objects, cultural items, Indian sacred sites, archaeological artifact collections, and archaeological resources (36 C.F.R. 800.16(1)(1)). Cultural resources also include resources with unknown NRHP eligibility status.

3.5.1 Inventory of Resources in the Study Area

As of June 2024, there are no cultural resources listed on the South Carolina database (ArchSite) within the area of potential effects (APE)³ (Figure 5). Archsite is an online geographic information system maintained by the South Carolina Department of Archives and History and the South Carolina Institute of Archaeology and Anthropology (SCIAA) that combines data from the state's archaeological and built heritage. The database includes recorded cultural resources regardless of NRHP eligibility status, including archaeological sites, historic structures, historic districts, historic areas, and civil war earthworks.

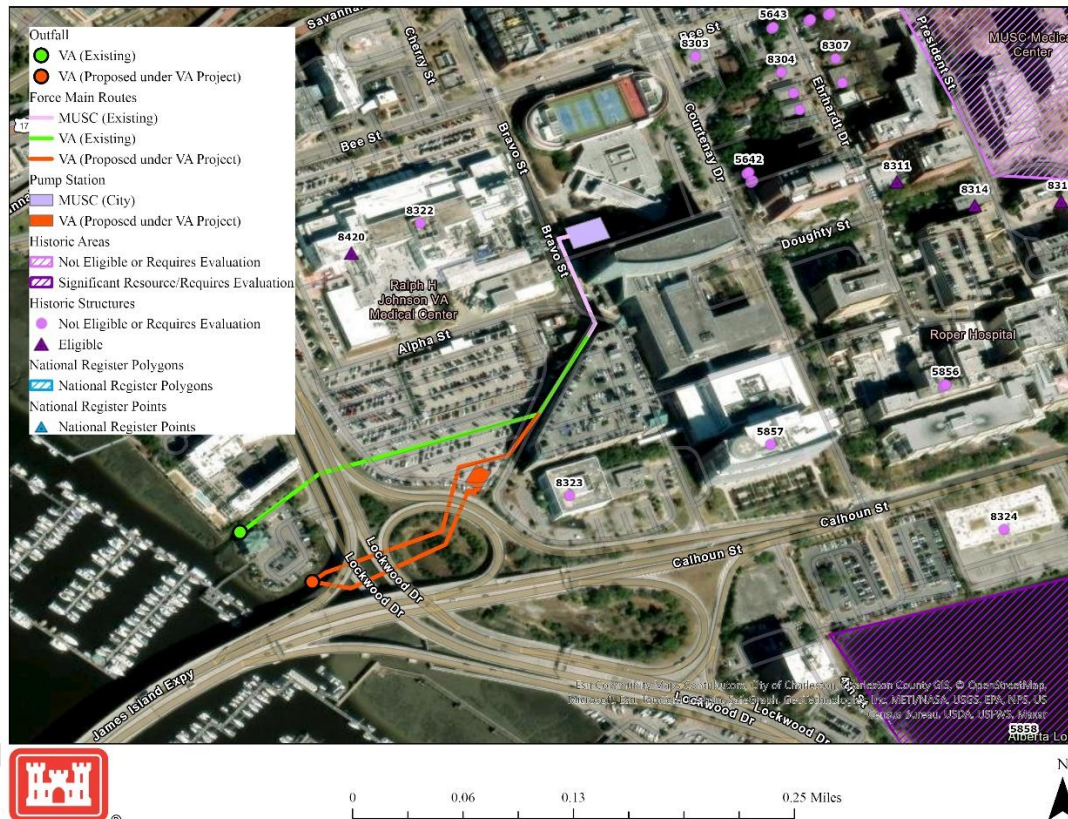


Figure 5. ArchSite database overlay of NRHP data near project area

3.5.2 Cultural Resources Surveys

Cultural resource surveys may be performed within the APE to verify no resources will be impacted by excavation needed for upfitting of the short inflow pipes.

Survey results will be coordinated with the South Carolina State Historic Preservation Office (SHPO), SCIAA, and consulting tribes.

³ The “area of potential effects (APE)” is defined in the regulations implementing the Section 106 review process as “The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.” (36 C.F.R. Part 800.16(d)).

3.6 SEDIMENT

Based on previous sediment sampling done throughout Charleston Harbor, the Ashley River, and nearby Cooper and Wando Rivers by Van Dolah et al (1990), on average the portion of the Ashley River closest to the action area is composed mostly of silts and clays (around 50% and 30%, respectively). The remaining portion of sediment sampled showed a roughly even mix of organic matter and sand and a small proportion of calcium carbonate. Upstream, beyond the peninsula, sediment in the Ashley River is composed of much greater proportions of coarse grain sands (about 80-90%) and gradually higher amounts of calcium carbonate. Downstream of the action area into Charleston Harbor, sediments are also generally of a coarser grain size with proportionally more sand (~35%) and less silts and clays (~20-25% each). There is also much greater seasonal variation in sediment composition nearest the action area relative to upstream portions of the Ashley River, being more closely tied to tidal influence. Directly adjacent to the area of the outfall associated with the action area, sediment is typified as a sandy clay sediment consisting of >38% clay with sand and silt.

3.7 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

In accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, federal agencies must assess whether disproportionately high and adverse effects would be imposed on minority or low-income areas by federal actions. In addition, Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires federal agencies to assess the environmental health and safety risk of their actions on children. Section 112(b)(1) of WRDA 2020 (P.L. 166-260) requires the formulation of water resource projects to comply with “*any existing Executive Order regarding environmental justice.*” Moreover, Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, Section 219 directs federal agencies to “[develop] programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities”.

3.7.1 *Socioeconomics of Action Area*

According to the Council on Environmental Quality’s Climate and Economic Justice Screening Tool, Tract Number 45019000600 is not a disadvantaged population. According to the U.S. Census Bureau, data from the 2021 American Community Survey 5-year Estimates indicated the total population of those sampled from Census Tract 6 totaled 1,274. Of those who were censused, 3.0% were under age 18, and 86.4% reported as white alone.

The American Community Survey also included economic data for Census Tract 6. For instance, median household income is \$67,115 - higher when compared to that of South Carolina at \$59,318. Of the population for whom poverty status is determined, 32.4% were below the poverty line in the past 12 months, including 0.0% of those under 18 years old, 35.1% of those 18-64 years of age, 12.5% of those 65 years or older, and 99.0% of which identified as white alone, not Hispanic or Latino.

Using the Council on Environmental Quality’s (CEQ) Climate and Economic Justice Screening Tool revealed that the census tract 45019000600 is not identified as disadvantaged. Communities are identified as disadvantaged in the health burden category if at or above the 90th percentile for asthma, diabetes, or heart disease, or at or above the 90th percentile for low life expectancy, above the 65th percentile for low income, and 80% or more of adults 15 or older are not enrolled in higher education.

3.8 TERRESTRIAL BIOLOGICAL RESOURCES

3.8.1 *Terrestrial Habitat and Species*

Terrestrial habitats within and adjacent to the action area include tidal marsh, sand and/or mudflats. Nearby terrestrial habitats may include mammals like raccoon (*Procyon lotor*), river otter (*Lontra canadensis*), marsh rice rat (*Oryzomys palustris*), Virginia opossum (*Didelphis virginiana*), and marsh rabbit (*Sylvilagus palustris*), as well as a variety of reptiles/amphibians (e.g., frogs, toads, lizards, snakes, turtles). Wetlands along the Ashley River are utilized by a variety of marine birds, marsh birds and shorebirds year-round. These most commonly include laughing gull (*Leucophaeus atricilla*), double-crested cormorant (*Phalacrocorax auratus*), brown pelican (*Pelecanus occidentalis*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), and boat-tailed grackle (*Quiscalus major*) among others.

Review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation database (<https://ecos.fws.gov/ipac/>) resulted in identification of the 28 migratory birds of conservation concern that have the potential to present within the action area.

3.9 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA), as amended (16 U.S.C. §§ 1531 – 1543), was passed to conserve the ecosystems upon which endangered and threatened species depend, and to conserve and recover those species. An endangered species is defined by the ESA as any species in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant part of its range. Critical habitats, essential to the conservation of listed species, also can be designated under the ESA. The ESA establishes programs to conserve and recover endangered and threatened species and makes their conservation a priority for federal agencies. Section 7 of the ESA requires federal agencies to consult with USFWS and NMFS Protected Resources Division (PRD) when their proposed actions may affect endangered or threatened species or their critical habitats.

Pursuant to Section 7 of the ESA, USACE has evaluated impacts to ESA-listed species from implementation of actions for each of the alternatives considered herein. A list of ESA species known or expected to be on or near action area was obtained using USFWS's Information for Planning and Consultation tool and is included for reference in Table 4. A list of ESA species for the state of South Carolina was obtained from NMFS' website (<https://www.fisheries.noaa.gov/southeast/consultations/threatened-and-endangered-species-list-south-carolina>) and is included for reference in Table 5. However, the likelihood of a species' occurrence specifically within the action area at any given time depends on key spatial and temporal factors such as availability of suitable habitat, migratory behavior, prey availability, adverse weather events and more.

Notably, the USFWS and NMFS PRD share jurisdiction of sea turtles, with NMFS having jurisdiction when in the marine environment and USFWS having jurisdiction when in the terrestrial environment.

Table 3 USFWS-listed ESA species known or expected to be on or near action area

Common Name	Species	ESA Status ¹	Present
Mammals			
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	T	N
Tricolored Bat	<i>Perimyotis subflavus</i>	PE	N
West Indian Manatee	<i>Trichechus manatus</i>	T	Y
Birds			
Eastern Black Rail	<i>Laterallus jamaicensis ssp. jamaicensis</i>	T	N
Piping Plover	<i>Charadrius melodus</i>	T	N
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	N
Rufa Red Knot	<i>Calidris canutus rufa</i>	T	N
Wood Stork	<i>Mycteria americana</i>	T	N
Reptiles²			
Green Sea Turtle ³	<i>Chelonia mydas</i>	T	Y
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E	Y
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	N
Loggerhead Sea Turtle ⁴	<i>Caretta caretta</i>	T	Y
Plants			
American Chaffseed	<i>Schwalbea americana</i>	E	N
Canby's Dropwort	<i>Oxypolis canbyi</i>	E	N
Pondberry	<i>Lindera melissifolia</i>	E	N

¹ESA classifications include: T = threatened, PE = proposed endangered, and E = endangered

²Administrative jurisdiction shared between USFWS and NMFS

³Consisting of North Atlantic Distinct Population Segment

⁴Consisting of Northwest Atlantic Ocean Distinct Population Segment

Table 4 NMFS-listed ESA species list for South Carolina

Common Name	Scientific Name	ESA Status ¹	Present
Marine Mammals			
Sei Whale	<i>Balaenoptera borealis</i>	E	N
Blue Whale	<i>Balaenoptera musculus</i>	E	N
Fin Whale	<i>Balaenoptera physalus</i>	E	N
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	E	N
Sperm Whale	<i>Physeter macrocephalus</i>	E	N
Fish			
Atlantic Sturgeon ²	<i>Acipenser oxyrinchus</i>	E	Y
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	E	Y
Oceanic Whitetip Shark	<i>Carcharhinus melodus</i>	T	N
Giant Manta Ray	<i>Manta birostris</i>	T	Y
Sea Turtles³			
Green Sea Turtle ⁴	<i>Chelonia mydas</i>	T	Y
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E	Y
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	N
Loggerhead Sea Turtle ⁵	<i>Caretta caretta</i>	T	Y
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	E	N

¹ESA classifications include: T = threatened and E = endangered

²Consisting of South Atlantic and Carolina Distinct Population Segments

³Administrative jurisdiction shared between USFWS and NMFS

⁴Consisting of North Atlantic Distinct Population Segment

⁵Consisting of Northwest Atlantic Ocean Distinct Population Segment

3.9.1 West Indian Manatee

Manatees occur in the southeastern U.S., east coast of Mexico and Central America, northeastern South America, the Greater Antilles, and parts of the Lesser Antilles. In general, their southeastern U.S. range is predominately in Florida year-round, and sometimes Georgia and Alabama during warmer months. However, some manatees have been documented as far north as Massachusetts and west to Texas (Gunter 1941; Domning and Hayek 1986; Fertl et al. 2005). Their range is limited by intolerance of cold; thus, mostly warmer temperate coastal and inshore waters, natural warm water springs, and even industrial

outfalls provide conditions necessary for manatee occupation. Broader systems which provide these conditions can include coastal and riverine systems which are freshwater, brackish, or marine. Preferred foods encompass another important component of their distribution and include various submerged, emergent, and floating vegetation.

Historically, impacts to manatee habitat and direct causes of mortality have been drivers of population decline. Threats to manatee habitat include loss of seagrass due to marine construction activities, propeller scarring and anchoring, and oil spills; loss of freshwater due to damming and competing uses; and increasing coastal commercial and recreational activities (USFWS 2007). Seagrass losses may also result from dredging, fishing, anchoring, eutrophication, siltation, and coastal development. Most critical, however, is loss of warm-water natural spring areas in Florida, from loss of flow, diminished water quality, or human activities (Taylor 2006). Direct losses of manatees in the southeastern U.S. primarily involve watercraft collisions, fishing gear entanglement, water control structures, exposure to contaminants, algal blooms, and cold weather among other factors (USFWS 2016).

From 1850-2004, many manatee sightings were reported to the South Carolina Department of Natural Resources (SCDNR) in the Ashley and Cooper Rivers annually (<https://www.dnr.sc.gov/manatee/distribute/2000.html>).

3.9.2 *Sea Turtles*

There are three species of sea turtles known to occur in or near waters of Ashley River and Charleston Harbor, all of which are federally-listed as threatened or endangered species: Kemp's ridley, loggerhead and green. These turtles can be found in South Carolina's near shore waters April through November or nesting on beaches from May through October (SCDNR 2014). Kemp's ridley sea turtles are found in nearshore waters but are less likely to be in the action area. Loggerhead and green sea turtles are the most common species in South Carolina waters, and their distribution at different life stages varies including offshore waters, bays, inlets, river mouths, salt marshes, creeks, ship channels, and sandy beaches for nesting. Subadult and adult loggerheads move into coastal waters, such as Charleston Harbor, to prey on mollusks, crustaceans, and fish (USFWS 2023). Loggerhead sea turtle eating preferences tend to be horseshoe crab, then blue crab, then finfish. Ultimately, impacts salt marsh could lead to alteration of the loggerhead sea turtle food web (Seney and Musick 2007; Boutin and Targett 2013).

A trawling study conducted within the Charleston Harbor shipping channel between 2004-2007 showed that loggerhead sea turtles are present in the channel in increased numbers, and are of increased size, compared to the early 1990s (Arendt et al. 2012). Both loggerheads and greens could be found in the Cooper and Ashley Rivers and around the Peninsula.

Threats to sea turtles include vessel strikes, dredging, fishing by-catch and entanglement, degradation of foraging habitat, pollution, and disease. They are also threatened by various natural and anthropogenic impacts to their nesting habitat, such as beach erosion, beach armoring, artificial lighting, and nest predation.

3.9.3 *Atlantic and Shortnose Sturgeon*

The two federally-protected fish species that commonly occur in or near the project area, particularly the Charleston Harbor, are the shortnose sturgeon and Atlantic sturgeon. Like the Atlantic sturgeon, shortnose sturgeon are anadromous, migrating up rivers from the ocean to spawn. However, shortnose sturgeon spend most of their time as adults in fresh and brackish waters of their natal rivers and rarely venture into lower coastal reaches and the ocean (SCDNR 2020a, NMFS 2024b). In contrast, Atlantic sturgeon primarily occupy nearshore coastal waters from late fall to early summer and returns to natal rivers to

spawn between summer and fall (Wirgin et al. 2002, NMFS 2024a). It is primarily during this overwintering period (i.e., December through late April) Atlantic sturgeon adults and subadults may be the in project area (NMFS 2023a).

Although both species have been detected in the Ashley River, most sturgeon which might occur in the river are likely to be juveniles and transient adults of Atlantic sturgeon (personal communication, Bill Post, SCDNR Diadromous Fish Coordinator). Shortnose sturgeon are currently found in the Cooper River, and the Carolina Distinct Population Segment (DPS) of Atlantic sturgeon is found throughout the Charleston Harbor, with portions of the Cooper River designated as critical habitat for the Atlantic sturgeon. Telemetry studies done by SCDNR of shortnose and Atlantic sturgeon confirm movement throughout the Charleston Harbor, and in the Cooper River with the highest usage of the Cooper River by shortnose sturgeon where the freshwater-to-saltwater interface occurs upstream of the project area.

Atlantic sturgeon are bottom feeders and in South Carolina are known to forage on invertebrate worms (mostly polychaetes), amphipods and mayfly larvae (SCDNR 2020b), but more broadly on crustaceans, mollusks, and even small fish (NMFS 2024a). Likewise, shortnose sturgeon feed along sandy, muddy river bottoms on similar prey (NMFS 2024b). Historically, over-fishing affected sturgeon populations, but current threats to these species include habitat loss or fragmentation, dredging, migration/passage barriers, decreased water quality, and entanglement in fishing gear, as well as vessel strikes for Atlantic sturgeon (NMFS 2024a, NMFS 2024b).

3.9.4 *Giant Manta Ray*

Giant manta rays are found in tropical, subtropical and temperate water globally, often offshore and near coastlines including estuarine waters near inlets, bays, tidal outflows, and river mouths (feeding around outfall plumes) (Adams and Amesbury 1998; Pate and Marshall 2020; Farmer et al. 2022). The species generally prefers areas where its primary prey source of zooplankton is abundant, though the species also consumes small and moderate size fishes and shrimp (Burgess et al. 2016; Stewart et al. 2016). Various life stages of ray may occur within Charleston Harbor, and the Ashley and Cooper Rivers foraging and even with the harbor serving as nursing grounds when waters are warmer (White and Potter 2004; Cerutti-Pereyra et al. 2014).

The primary prey of giant manta ray inside the harbor and estuarine environment, zooplankton, are highly influenced by spatiotemporal variations in hydrochemical and physical factors (Bianchi et al. 2003; Sridhar et al. 2006) and may serve as biological indicators of water quality (Hwang et al. 2010). The distribution and abundance of zooplankton in estuarine environments is predominately influenced by salinity (Hwang et al. 2010), while other factors like industrial and domestic effluents and suspended particulate matter have impacts to zooplankton (Bianchi et al. 2003; Cornils et al. 2005).

3.9.5 *Critical Habitat*

There are no areas of critical habitat, as described in the Federal Register, that overlap with the action area.

4 ENVIRONMENTAL CONSEQUENCES

This section describes the potential effects on the existing conditions for considered resources from implementation of the alternatives.

4.1 AIR QUALITY AND NOISE

No Action Alternative

Under this alternative, the proposed upfitting would not occur as Federal assistance by USACE would no longer be considered. This alternative would likely result in the repair/rehabilitation/replacement of the pump infrastructure through other means to combat potential stormwater events in the future. Although there would be no impacts to air quality and noise associated with this alternative, impacts may occur associated with similar actions taken in the absence of Federal action.

Proposed Action Alternative

Under this alternative, impacts to air quality and noise may involve temporary impacts associated with construction as well as those relative impacts associated with operation of the pumps.

The use of construction equipment and heavy machinery in the replacement and upfitting of the short inflow pipes as well as enclosure of the pump station would result in elevated local noise levels and would contribute to some local emissions. However, these elevated noise and emissions conditions would be relative to the neighboring environment which routinely experiences high levels of vehicular traffic and where construction activities are not uncommon. These conditions would also be temporary and relatively small in scale when compared to new construction and maintenance activities which are common in the surrounding Charleston downtown area.

Noise and emission levels associated with increased capacity pumping infrastructure is likely to result in smaller scale impacts relative to existing conditions. Construction of an enclosure of the PS would serve to buffer noise associated with pump operation from the external environment and thus reduce environmental noise levels. Emissions associated with pump operation may be slightly elevated during the construction phase as a small, temporary generator system will be required for the short period of time where the system is reconfigured. However, relative to existing conditions, this would not meaningfully contribute to negatively affecting local air quality; and upon completion of construction, the pumps are expected to perform more efficiently despite increased capacity.

4.2 AQUATIC RESOURCES AND WATER QUALITY

No Action Alternative

Under this alternative, impacts to aquatic resources and water quality are likely to be greater than under existing conditions. This is because it is expected that efficiency of the existing pumps to manage stormwater would likely decline until they could be replaced or upfitted through means other than through Federal assistance. This may contribute to events where water quality associated with management of stormwater in the basin is worsened by a lack of pump operability. These water quality conditions would inevitably be carried into the surrounding aquatic environment.

Proposed Action Alternative

Under this alternative, adverse impacts to aquatic resources and wetlands are expected to generally be reduced relative to existing conditions for several reasons.

Knott and Martore (1991) documented impacts of Hurricane Hugo on benthic fauna and nekton in the Ashley River and Charleston Harbor and noted declines in dissolved oxygen (DO) levels and salinity associated with influx of stormwater contents (i.e. freshwater precipitation, sediment runoff, septic and

sewage failure, etc.) into the waterways led to (1) displacement of motile estuarine fauna from upstream habitats to those seaward where salinity was less impacted, (2) die-offs of estuarine fauna where DO decreased substantially, (3) and post-storm recolonization by opportunistic species which are more tolerable of conditions of low DO and salinity levels. By increasing the capacity of pumps to convey stormwater downstream, stormwater would be removed from the surface in smaller time intervals, limiting potential damage to infrastructure, leaching of contaminants, and suspension of debris into stormwater which may occur as a result of accumulated and prolonged flooding. Sediment, debris and contaminants which become suspended in unabated floodwaters at point and nonpoint sources are primarily what affect DO levels following a storm event, which Knott and Martore (1991) demonstrated led to aquatic faunal die-offs. Increasing the capacity for stormwater conveyance downstream would also reduce time intervals of saline water displacement, limiting corresponding periods of faunal displacement.

Increased capacity from installation of higher power pumps could have localized impacts (i.e., more extensive stormwater boundary, broader density stratification) at the outfall into the Ashley River. However, these impacts would only be realized during storm events when proposed pumps would need to exceed existing pump capacities. These smaller scale, temporary impacts would be of minimal size and scale relative to the broader level impacts of storm events like those from Hugo as described by Knott and Martore (1991), and the coinciding benefits of the increased pump capacities described above would provide net benefits for estuarine fauna.

4.3 CLIMATE CHANGE

No Action Alternative

Under this alternative, the proposed upfitting would not occur. This alternative would not meaningfully affect existing conditions with respect to local climate and the phenomenon of climate change. However, this alternative would likely contribute to a reduced capacity for the local population to effectively manage stormwater impacts to the environment which are projected to become generally greater in strength through time.

Proposed Action Alternative

Conditions under this alternative would not meaningfully affect existing conditions with respect to local climate and the phenomenon of climate change. However, this alternative would contribute to an increased capacity for the local population to effectively manage stormwater impacts to the environment which are projected to become generally greater in strength through time.

4.4 COASTAL ZONE RESOURCES

No Action Alternative

Under this alternative, the proposed upfitting would not occur as Federal assistance by USACE would no longer be considered. This alternative would likely result in the repair/rehabilitation/replacement of the pump infrastructure through other means to combat potential stormwater events in the future. Thus, impacts to coastal zone resources are expected to be similar to those under the Proposed Action Alternative.

Proposed Action Alternative

Conditions under this alternative have been considered by USACE and the associated actions have been determined to be consistent with the South Carolina Coastal Management Program (SCCMP) and its

enforceable policies to maximum extent practicable. Enforceable policies applicable to this Federal project as determined by USACE includes XII (Activities in Areas of Special Resource Significance) and XIII (Stormwater Management Guidelines). Under the Proposed Action Alternative, no significant negative impact on navigation channels and wetlands are expected. Further, stormwater runoff storage requirements will be met, and appropriate stormwater management and sediment reduction plan submissions are included with applicable stormwater permitting.

By incorporating here, the determination that the Federal action is consistent with the SCCMP and its enforceable policies to the maximum extent practicable, this EA serves as the Coastal Zone Consistency Certification request for this action. Correspondence with SCDES Office of Ocean and Coastal Resource Management regarding compliance with South Carolina's Coastal Zone Management Program will be included in the final draft of this EA in Appendix E.

4.5 CULTURAL RESOURCES

Federal agencies are required by Section 106 of the NHPA and by NEPA to consider the possible effects of their undertakings on historic properties. For cultural resources, the threshold for significant impacts includes any disturbance that cannot be mitigated and affects the integrity of a historic property (i.e., a cultural resource that is eligible for the NRHP). The threshold also applies to any cultural resource that has not yet been evaluated for its eligibility to the NRHP or disturbs a resource that has importance to a traditional group under the American Indian Religious Freedom Act, EO 13007, and NAGPRA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment by introducing visual or audible elements that are out of character for the period the resource represents, or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts are those that may occur as a result of the completed project, such as increased vessel traffic in the vicinity of the resource and the associated hydrologic changes associated with this increase.

No Action Alternative

Under this alternative, the proposed upfitting would not occur as Federal assistance by USACE would no longer be considered. Though repair/rehabilitation/replacement of the pump infrastructure through other means could occur in the future, such efforts may be of a different spatial or temporal context and prolong the period of vulnerability of the City in offsetting impacts of heavy stormwater events or reduce the potential capacity to offset these potential impacts. This alternative represents a potential scenario where nearby cultural resources would continue to be impacted by potential stormwater damages which otherwise may be partially or fully ameliorated through collective inter-basin stormwater drainage efficiency. According to publicly viewable data on ArchSite, within the individual MUSC Drainage Basin serviced by the PS there are no historic structures eligible for listing under the NHPA.

Proposed Action Alternative

According to publicly viewable data on ArchSite, within the individual MUSC Drainage Basin serviced by the PS there are no historic structures eligible for listing under the NHPA. Within a half-mile radius of the project area, a number of cultural resource surveys have been performed under the context of other projects including the Courtenay Drive Improvement Project, Calhoun Street and James Island Connector, Ashley River Crossing Project and Lowcountry Rapid Transit Project. The only resource identified for additional survey and research is the Ralph H. Johnson VAMC. This site is outside of the MUSC Drainage Basin and action area and is not expected to be affected under this alternative; however, there is

some possibility that, as mentioned above, the collective inter-basin stormwater drainage efficiency could be improved under this alternative and provide protective benefits to this structure.

Future surveys may be performed where ground disturbance is necessary for replacement and upfitting of the short inflow pipes. Results of potential surveys will be coordinated under Section 106 prior to any work being performed in that APE.

4.6 SEDIMENT

No Action Alternative

Under this alternative, the proposed upfitting would not occur. This alternative would likely result in the repair/rehabilitation/replacement of the pump infrastructure through other means to combat potential stormwater events in the future. No significant difference between this alternative and the Proposed Action Alternative in effects to sediment are expected.

Proposed Action Alternative

Under this alternative, impacts to sediment would be insignificant. Although some sediment disturbance will be necessary to replace short inflow pipes, it would occur in a very small impact area (<1 acre). Furthermore, no filling or discharge into local waterway would occur as part of construction and would not impact aquatic sediments. Since the ability for the PS to output a greater stormwater capacity through larger force mains would occur, no increased flow velocity is expected at the estuarine outfall and thus, no significant effect to sediment conditions (i.e., turbidity, scouring, etc.).

4.7 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

No Action Alternative

Under this alternative, the proposed upfitting would not occur. This alternative would likely result in the repair/rehabilitation/replacement of the pump infrastructure through other means to combat potential stormwater events in the future. However, such efforts may be of a different spatial or temporal context and prolong the period of vulnerability of the City in offsetting impacts of heavy stormwater events or reduce the potential capacity to offset these potential impacts as Federal assistance by USACE would no longer be considered. This alternative would result in fewer benefits to the local economy relative to the Proposed Action Alternative.

Proposed Action Alternative

Under this alternative, some economic benefits would be realized as more efficient reduction in flood damages would occur. These benefits would not be disproportionate relative to local demographics.

4.8 TERRESTRIAL BIOLOGICAL RESOURCES

No Action Alternative

Under this alternative, the proposed upfitting would not occur as Federal assistance by USACE would no longer be considered. Though repair/rehabilitation/replacement of the pump infrastructure through other means could occur in the future, such efforts may be of a different spatial or temporal context and prolong the period of vulnerability of the City in offsetting impacts of heavy stormwater events or reduce the potential capacity to offset these potential impacts. This alternative represents a potential scenario where

nearby terrestrial biological resources would continue to be impacted by potential stormwater damages which otherwise may be partially or fully ameliorated through collective inter-basin stormwater drainage efficiency.

Proposed Action Alternative

Under this alternative, impacts to terrestrial biological resources overall would be insignificant. Some disturbance associated with construction of facilities and upfitting of the short inflow pipes would affect some nearby plants and wildlife. However, impacts would be temporary in duration and insignificant in magnitude.

4.9 THREATENED & ENDANGERED SPECIES

No Action Alternative

Under this alternative, impacts to threatened and endangered species are likely to be greater than under existing conditions. This is because it is expected that efficiency of the existing pumps to manage stormwater would likely decline until they could be replaced or upfitted through means other than through Federal assistance. This may contribute to events where water quality associated with management of stormwater in the basin is worsened by a lack of pump operability. These water quality conditions would inevitably be carried into the surrounding aquatic environment.

Proposed Action Alternative

Under this alternative, negligible or beneficial effects on threatened and endangered species are expected with long-term improvements to water quality downstream of the project. This includes those on West Indian Manatee (USFWS jurisdiction), and green sea turtle, Kemp's ridley sea turtle, loggerhead sea turtle, Atlantic sturgeon, shortnose sturgeon, and giant manta ray (NMFS jurisdiction). USACE has made determinations of *may affect not likely to adversely affect* for each of these species given the insignificant effects anticipated to these species with this alternative. Consultation with NMFS is ongoing, however, informal consultation with USFWS concluded on July 9, 2024, with receipt of an email stating that the Service concurred with the determination made for West Indian manatee. All correspondence will be included in Appendix B.

5 CUMULATIVE EFFECTS

Cumulative impacts are defined by 40 C.F.R. 1508.1(g)(3) NEPA regulations as follows:

Cumulative effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. 1508.1(g)(3). The following paragraphs summarize the cumulative impacts expected from the proposed action.

5.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

As of the 1984 Master Drainage Plan, the record shows stormwater drainage facilities on the peninsula consisted mainly of vitrified clay pipe or brick arches, some which dated back to the 1850's (Master Plan

1984). Also dating back to the mid-19th century was the tidal drain system which was a combined sanitary and storm sewer and interconnected with outlets to either the Ashley or Cooper Rivers. A map of the drainage system of Charleston dated to 1950 shows the entire area west of what is today Courtenay Drive as wetland fill. Therefore, it is reasonable to conclude all stormwater drainage and conveyance systems in the MUSC basin were constructed post-1950. In the 1984 Master plan, the early combined sanitary and storm sewer system was used as a backbone to build upon and improve into a new system for the peninsula equipped with nine new pump stations and future improvements to upstream line work, along with additional pumps and force mains. Existing drainage facilities in the nearby basins at the time included two systems draining into the Ashley River via a 5'x8' box culvert under Lockwood Drive which persists today. A PS on Doughty Street, built sometime between 1950 and 1984, serviced part of the area but was no longer used following construction of the VAMC PS with a capacity of up to 30,000 GPM and a drainage area of about 56 acres including part of the MUSC PS project area. The current MUSC PS proposed for upfitting herein was built in 2007 as part of hospital facility construction and was subsequently transferred to the City to operate and maintain.

Spring/Fishburne US 17 Route Drainage Improvements Project

The Spring/Fishburne US 17 Route Drainage Improvements project is a multi-phased large-scale drainage basin project which overlaps with the MUSC drainage basin. The project objective is to improve drainage and reduce the frequency, severity, and duration of flooding for the Spring and Fishburne basins by moving water from the surface through a network of surface collection pipes, vertical drop shafts, and deep tunnels to a PS where it will ultimately end up in the Ashley River. Phase I of the project occurred from 2009 to 2012 and included repair and replacement of the surface collection system pipe network along the Septima Clark Parkway northeast of the MUSC basin. This involved installation of 5,500 ft of new pipe, 175 new structures, and streetscaping. Phase II occurred from 2015 to 2017 and included repair and replacement of the remaining portion of the surface collection system pipe network along the Septima Clark Parkway and adjacent streets. This included 12,000 feet of new pipe and 300 new structures to convey flow. Eight vertical drop shafts and a deep tunnel system were also constructed. Phase III occurred from 2016 to 2020 and included construction of the deep tunnel system including 9,000 feet of tunnel and four large diameter shafts. Phase IV occurred from 2019 to 2023 and included construction of the wetwell and outfall portion of the PS next to the Ashley River. The wetwell was constructed at 137 feet long, 52 feet wide and 40 feet deep and a 500-foot-long outfall into the Ashley. Phase V is ongoing and projected into 2026 and includes construction of the PS along with three pumps capable of moving 360,000 GPM, a superstructure building that houses the pumps and supporting mechanical and electrical components. Collectively, this network of pipes and pump infrastructure increases flow rate of water from surface to the outfall tenfold.

Medical District Drainage Tunnel Extension at Ehrhardt Street

The Ehrhardt Project constructed a deep tunnel extension and drop shaft to drain the street level stormwater collection system into the deep tunnel and pump systems of the US-17/Spring-Fishburne Project. The Ehrhardt Project reached substantial completion in March 2024.

VAMC Parking Garage and Pump Station Project

To accommodate architectural improvements at the VAMC and to improve handling of stormwater on site and from nearby basins, the VAMC is proposing to change the alignments of several pipes and force mains which currently fall below a proposed 2-story parking garage. In addition, a new pump station in the southern end of the existing VAMC parking lot is proposed which will be designed to handle a maximum of 28,000 GPM of stormwater. This project will involve relocating and upsizing of force mains downstream of the FM exiting the MUSC PS, including upsizing the existing 30"-24" FM junction

between the MUSC PS FM and the VAMC FM to a 30"-42" junction. This would also involve construction of a new 13'x13', 5' precast concrete outfall structure on the south side of the marina parking lot off Lockwood Drive. This outfall structure is proposed to have rip rap on all sides of the structure and extending to a minimum of 4-ft around and sloping down in a 1:3 ratio.

Other projects in the Lower Ashley River Watershed

Barberry Woods Conveyance Project
Calhoun West/Beaufain Drainage Improvement Project
Central Park Drainage Basin Improvements
Winderemere Drainage Improvement Project

Overall

Collectively, there are a number of past, present and future drainage projects planned in the Lower Ashley River watershed including those on the peninsula, in West Ashley and on James Island. Stormwater management, although has grown with development of the area, has improved in design and in meeting permitting and regulatory criteria to protect local waterways like the Ashley River. This project, in conjunction with other drainage and stormwater management projects in the watershed are anticipated to create net improvements to the local environment and economy.

5.2 RESOURCE AREAS EVALUATED FOR CUMULATIVE EFFECTS

Implementation of the Proposed Action Alternative would have no effects or negligible effects on air quality and noise, aquatic resources and water quality, climate change, sediment, socioeconomics and environmental justice, and terrestrial biological resources. As such, these resources were not carried forward into the cumulative effects analysis.

The remaining resources evaluated herein were included for further evaluated with respect to cumulative impacts (Table 6). Conclusions on these impacts will be included in the final report. In summary, no adverse cumulative impacts are expected as a result of implementing the Proposed Action Alternative.

Table 6. Resources analyzed further for cumulative impacts

Resource	Cumulative Impact
Coastal Zone Resources Cultural Resources Threatened and Endangered Species	Non-contributing or insignificant foreseeable impacts are anticipated to these resources. Consultation with appropriate resource agencies is ongoing for these resources. Avoidance and minimization measures included in outcome of consultations would be implemented to the extent practicable and reduce potential for impacts which may be cumulative.

6 COMPLIANCE WITH ENVIRONMENTAL LAWS, STATUTES AND EXECUTIVE ORDERS

6.1 CLEAN AIR ACT OF 1972

The CAA sets goals and standards for the quality and purity of air. It requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. Charleston County is designated as in attainment for all principal pollutants. The short-term effects to air quality from operation of project equipment would not result in permanent adverse effects to air quality in Charleston County. Air quality permits would not be required for this project.

6.2 CLEAN WATER ACT OF 1972

The Clean Water Act (CWA) sets and maintains goals and standards for water quality and purity. Since there is no discharge of fill material into/excavation of waters of the United States, no certification is required under Section 401 or 404. This was verified in correspondence with SCDES BOW (See Appendix C). Section 402 of the CWA requires that a discharge of any pollutant or combination of pollutants to surface waters that are deemed waters of the United States be regulated by a National Pollutant Discharge Elimination System (NPDES) permit. The City of Charleston is required to have a NPDES permit to discharge stormwater—officially titled the “*State of South Carolina NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems (SMS4)*.” Since land disturbing activities contribute to the discharge of pollutants, the NPDES permit requires that the City of Charleston encourage, promote, and implement practices, programs, and procedures for reducing or limiting discharge of pollutants into receiving waters of the State. The permit also requires that the City of Charleston develop and implement a Stormwater Management Program to control the discharge of pollutants to the maximum extent practicable. The location of the NPDES General Permit (SCR031901) can be found in at <https://www.charleston-sc.gov/>.

Any additional permits and permit numbers will be issued once construction plans are complete, the plans have been reviewed and approved by the city and SCDES, and the Notice of Intent is submitted to the city/SCDES. A copy of those permits may be obtained upon request.

6.3 COASTAL BARRIER RESOURCES ACT OF 1982

The Coastal Barrier Resources Act (CBRA) provides for a Coastal Barrier Resources System (CBRS) of undeveloped coastal barriers along the Atlantic and Gulf Coasts, including islands, spits, tombolos, and bay barriers that are subject to wind, waves, and tides such as estuaries and nearshore waters. Resources in the system are to be protected by restricting Federal expenditures that have the effect of encouraging development of coastal barriers. The action area does not occur within a designated CBRS.

6.4 COASTAL ZONE MANAGEMENT ACT OF 1972

The Coastal Zone Management Act (CZMA) requires that:

“...each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs.”

Per the South Carolina Coastal Tidelands and Wetlands Act (S.C. Code Ann. Section 48-39-10, et seq.), USACE is currently seeking concurrence from the SCDES, Office of Ocean and Coastal Resource Management that the project will be consistent with the Coastal Zone Management Program. A record of concurrence will be included in the final draft of the EA in Appendix E.

6.5 ENDANGERED SPECIES ACT OF 1973

The ESA is designed to protect and recover threatened and endangered species of fish, wildlife, and plants. Suitable habitat is present within the action area for the following federally listed species: West Indian manatee, green sea turtle, Kemp’s ridley sea turtle, loggerhead sea turtle, Atlantic sturgeon, shortnose sturgeon and giant manta ray.

In letters dated May 23, 2024, USACE initiated informal consultation with the Services (i.e., NMFS and USFWS) with regards to determinations of *may affect, not likely to adversely affect* for the

forementioned ESA-species. In an email dated July 9, 2024, USFWS concurred with the determination made for West Indian manatee. All responses received to these requests for consultation or as comments on this draft will be included in Appendix B of the final draft of the EA.

6.6 ENVIRONMENTAL JUSTICE (EO 12898)

In accordance with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, Federal agencies must assess whether disproportionately high and adverse effects would be imposed on minority or low-income areas by federal actions. In addition, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires Federal agencies to assess the environmental health and safety risk of their actions on children. Section 112(b)(1) of WRDA 2020 (P.L. 166-260) requires the formulation of water resource projects to comply with “any existing Executive Order regarding environmental justice.” Moreover, EO 14008, *Tackling the Climate Crisis at Home and Abroad*, Section 219 directs Federal agencies to “[develop] programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities”.

As noted above, total minority populations (i.e., all non-white and Hispanic or Latino racial groups) combined comprise approximately 13.6 percent of the population in the action area. Furthermore, children (under age 18) and impoverished (below poverty line for at least 12 months) comprise a small percentage of the affected communities. No significant impacts are anticipated.

6.7 FISH AND WILDLIFE COORDINATION ACT OF 1934

The Fish and Wildlife Coordination Act provides authority for USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features and requires that Federal agencies consult with USFWS, NMFS, and state resource agencies on the proposed project. This coordination is being conducted concurrent with the public review of the draft EA.

6.8 FLOODPLAIN MANAGEMENT (EO 11988)

To comply with EO 11988, the policy of USACE is to formulate projects that, to the extent possible, avoid or minimize adverse effects associated with the use of the floodplain and avoid inducing development in the floodplain unless there is no practicable alternative. The proposed action does not promote any development within the floodplain and is intended to provide flood reducing benefits to the area. For the reasons stated above, the project is in compliance with EO 11988, *Floodplain Management*.

6.9 PROTECTION OF WETLANDS (EO 11990)

This EO requires, among other things, that Federal agencies avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. No wetlands would be destroyed or modified as a result of the proposed action. This project is in compliance with the goals of this EO.

6.10 MAGNUSON-STEVEN'S FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act requires preparation of an EFH Assessment and consultation with NMFS when a project will have an adverse effect to essential fish habitat. On April 30, 2024, USACE initiated coordination with NMFS Habitat Conservation Division via

an email describing the proposed project. In a follow-up email on May 7, 2024, NMFS concluded adverse effects from the project would be minimal and would not require preparation of a formal EFH assessment. This correspondence is included in Appendix D.

6.11 MARINE MAMMAL PROTECTION ACT OF 1972

The Marine Mammal Protection Act (MMPA) prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. The MMPA defines "take" as *"the act of hunting, killing, capture, and/or harassment of any marine mammal; or, the attempt at such."* The MMPA defines harassment as *"any act of pursuit, torment or annoyance which has the potential to either: a. injure a marine mammal in the wild, or b. disturb a marine mammal by causing disruption of behavioral patterns, which includes, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."*

USACE does not anticipate the take of any marine mammal during any activities associated with the proposed project.

6.12 MIGRATORY BIRD TREATY ACT AND EO 13186

The Migratory Bird Treaty Act (MBTA) of 1918 is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possessing, transporting, and importing of migratory birds, their eggs, parts, and nests. EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*) directs Federal agencies to take certain actions to further implement the MBTA, including evaluating the effects of actions on migratory birds. No measurable impacts to migratory birds are expected as a result of the proposed action.

6.13 NATIONAL WILD AND SCENIC RIVERS

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Actions herein would not affect a stream or portion of a stream that is included in the National Wild and Scenic Rivers system.

6.14 NATIONAL HISTORIC PRESERVATION ACT OF 1966

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. According to publicly viewable data on ArchSite, within the individual MUSC Drainage Basin serviced by the PS there are no historic structures eligible for listing under the NHPA. Within a half-mile radius of the project area, a number of cultural resource surveys have been performed under the context of other projects including the Courtenay Drive Improvement Project, Calhoun Street and James Island Connector, Ashley River Crossing Project and Lowcountry Rapid Transit Project. The only resource identified for additional survey and research is the Ralph H. Johnson VAMC. This site is outside of the MUSC Drainage Basin and action area and is not expected to be affected.

Future surveys may be performed where ground disturbance is necessary for replacement and upfitting of the short inflow pipes. Results of potential surveys will be coordinated under Section 106 prior to any work being performed in that APE in accordance with 36 C.F.R. §800.4(d)(1), followed by consultation

with the SHPO, SCIAA, and consulting tribes. All resulting correspondence will be included in Appendix A.

6.15 PUBLIC INVOLVEMENT AND COORDINATION

The CEQ regulations require that Federal agencies “(a) make diligent efforts to involve the public in preparing and implementing their NEPA procedures and (b) provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents so as to inform those persons and agencies who may be interested or affected” (40 C.F.R. 1506.6(a) and (b)). As such, a draft of this document was shared with Federal, state, Tribal, and local government entities having jurisdictional responsibilities, or otherwise having an interest in the project, as well as members of the public. All comments received during the comment period and USACE responses will be included in Appendix F of the final EA.

7 LIST OF AGENCIES AND PERSONS CONSULTED:

7.1 TRIBES

Absentee-Shawnee Tribe of Oklahoma
Alabama-Quassarte Tribal Town
Catawba Indian Nation
Chickasaw Nation
Eastern Band of Cherokee Indians
Eastern Shawnee Tribe of Oklahoma
Kialegee Tribal Town
Poarch Band of Creek Indians
Shawnee Tribe
Thlopthlocco Tribal Town

7.2 FEDERAL AGENCIES

U.S. Environmental Protection Agency (EPA Region 4)
U.S. Fish and Wildlife Services (USFWS)
National Marine Fisheries Services (NMFS)

7.3 STATE AGENCIES

South Carolina Department of Environmental Services (SCDES)
South Carolina Department of Natural Resources (SCDNR)
South Carolina State Historic Preservation Office (SHPO)

7.4 LOCAL AGENCIES

The City of Charleston

8 ENVIRONMENTAL COMMITMENTS

USACE employs standard practices when conducting construction activities. Some of the more specific measures which would be applied to reduce the potential for adverse environmental effects during implementation of the project are as follows:

- All sites eligible for listing under the NHPA will be avoided by all construction and construction-related activities, including parking, equipment storage and staging. Site boundaries will be marked on plans and fenced off with temporary construction fencing during construction work to ensure the associated earthwork is not damaged.
- If human remains or intact archaeological features or deposits are uncovered, work in the vicinity of the discovery will stop immediately, and all reasonable measures to avoid or minimize harm to the finds will be taken. The contractor will ensure that archaeological discoveries are secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries. The contractor will provide immediate notice of such discoveries to USACE. The contractor shall contact the SHPO and USACE within 24 hours of the discovery.
- Upon discovery of any HTRW, associated contaminated soils associated will be properly managed per SCDES guidance.

9 LIST OF PREPARERS

Name	Affiliate	Branch	Discipline	Role
Niko Brown	US Army Corps of Engineers, Charleston District	Planning and Environmental Branch	Biologist	Principal Author

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**Appendix A NHPA Section 106 Compliance
Record**

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: [Thlopthlocco Tribal Town THPO; dfrank@ttown.org](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Thlopthlocco Tribal Town July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Mr. Frank,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: ["Tonya Tipton"](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Shawnee Tribe July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Ms. Tipton,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: THPO@pci-nsn.gov
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Poarch Band of Creek Indians July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Mr. Haikey,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: [Kialegee Tribe THPO D Cook](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Kialegee Tribal Town July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Mr. Cook,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: russtown@nc-choke.com; [Yerka, Stephen](#); [Miranda Panther](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Eastern Band of Cherokee July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Mr. Townsend,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: [Eastern Shawnee Tribe of Oklahoma \(THPO\)](#); rbarnes@estoo.net; lnuckolls@estoo.net
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Eastern Shawnee July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Ms. Nuckolls,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina. A hardcopy of the coordination letter will also be sent to you.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: brina.williams@alabama-quassarte.org
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Alabama-Ouassarte July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Ms. Williams,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: [Wenonah Haire](#); [Caitlin Rogers](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Catawba Indian Nation July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Dr. Haire,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina. A hardcopy of the coordination letter will be sent to you.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: [dfrazier@astribe.com](#); [106NAGPRA@astribe.com](#); [cbutler@astribe.com](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Absentee-Shawnee July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Ms. Frazier-Smith,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: jeemerson@scdah.sc.gov; [Elizabeth Johnson; rc@scdah.sc.gov](mailto:Elizabeth.Johnson@rc@scdah.sc.gov)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse SC SHPO July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

From: [Brown, Jonathan L CIV USARMY CESAS \(USA\)](#)
To: ["Karen Brunso"](#)
Subject: Coordination Letter (Charleston District, Charleston County, MUSC Pump Station)
Date: Tuesday, July 2, 2024 8:22:00 AM
Attachments: [Coordination Letter MUSC Pumphouse Chickasaw Nation July2024.pdf](#)
[MUSC PS Proposed Pipe Work.pdf](#)

Good morning Ms. Brunso,

An initial coordination letter is attached that provides information regarding proposed pipe work at the Medical University of South Carolina (MUSC) pump station. This project is being conducted by the U.S. Army Corps of Engineers, Charleston District, for Charleston County, South Carolina.

Please let me know if you have any questions or concerns regarding this correspondence. We look forward to receiving your response.

Sincerely,

Jonathan Brown, M.A., RPA
Archaeologist, Savannah District
U.S. Army Corps of Engineers
912-837-9825 (cell)
Jonathan.L.Brown@usace.army.mil

Appendix B ESA Section 7 Compliance Record

From: [Brown, Niko R CIV USARMY CESAC \(USA\)](#)
To: nmfs.ser.esa.consultations@noaa.gov
Cc: [Parrish, Nancy A CIV USARMY CESAC \(USA\)](#); [Shirey, Alan D CIV USARMY CESAC \(USA\)](#)
Subject: ESA Section 7 Expedited Consultation Request - MUSC Pumphouse Upfitting project
Date: Thursday, May 23, 2024 12:02:00 PM
Attachments: [MUSC Pumphouse NMFS PRD Informal Consultation Letter 5-23-24 \(Sign\).pdf](#)

Good afternoon,

The U.S. Army Corps of Engineers (USACE), Charleston District, proposes to fund the Medical University of South Carolina (MUSC) Pumphouse Upfitting project described in the attached letter. In brief, proposed improvements to the pump station include increased pumping capacity, improved hydraulic configuration in the wet well and inflow chamber, enclosure and conditioning of the control room, and replacement and upgrade of electrical, instrumentation and controls, and light. In addition, the project will include replacement or upsizing of two short inflow pipes at the wet well to improve inflow. More details and analysis of this project may be reviewed in a draft Environmental Assessment prepared by USACE which will be available in the near future.

USACE has reviewed the proposed project for its potential effects to ESA-listed species and their critical habitat. Based on the attached analysis, USACE has made determinations of *may affect, not likely to adversely affect* for the Atlantic sturgeon, shortnose sturgeon, giant manta ray, Kemp's ridley sea turtle, green sea turtle and loggerhead sea turtle. We request your concurrence with these determinations.

Please let me know if you have any questions or require additional information.

Thanks,

Niko Brown
Biologist, Planning & Environmental Branch
USACE – Charleston District

In-Office: T, W
Office Phone: (843) 329-8145

Telework: M, R, F
Cell Phone: (603) 258-8589



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, CHARLESTON DISTRICT
69A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

May 23, 2024

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
Southeast Regional Office
St. Petersburg, Florida

Dear Mr. Bernhart:

The U.S. Army Corps of Engineers (USACE), Charleston District, proposes to fund the Medical University of South Carolina (MUSC) Pumphouse Upfitting project as described in the attachment to this letter. We request initiation of informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) for the proposed project. Based on analysis of potential project effects, USACE has made determinations of *may affect, not likely to adversely affect* for some ESA-listed species. Our supporting analysis attached. We request your written concurrence with our determinations.

Pursuant to our request for expedited informal consultation, we are providing the following information:

- A description of the action to be considered;
- A description of the action area;
- A description of any listed species or critical habitat that may be affected by the action; and
- An analysis of the potential routes of effect on any listed species or critical habitat.

USACE has reviewed the proposed project for its potential effects to ESA-listed species and their critical habitat. Based on the attached analysis, USACE has made determinations of *may affect, not likely to adversely affect* for Atlantic sturgeon, shortnose sturgeon, giant manta ray, green sea turtle, Kemp's ridley sea turtle and loggerhead sea turtle. We request your concurrence with this determination.

If you have questions, please do not hesitate to contact Mr. Niko Brown, Biologist at niko.r.brown@usace.army.mil.

Sincerely,

Nancy Parrish,
Chief of Planning and Environmental Branch

Encl

Description of Action and Action Area

The MUSC stormwater pump station (PS), located on the Charleston Peninsula, is critical infrastructure for the City of Charleston (City) (Figure 1). The MUSC drainage basin forms a topographic low point without a natural outlet, and the PS is required to facilitate drainage. The MUSC basin was previously assessed and the pumping capacity was determined to be insufficient to meet the City's desired level of service (10-yr storm). Additionally, the PS facility and pumps were assessed, and improvements were recommended.

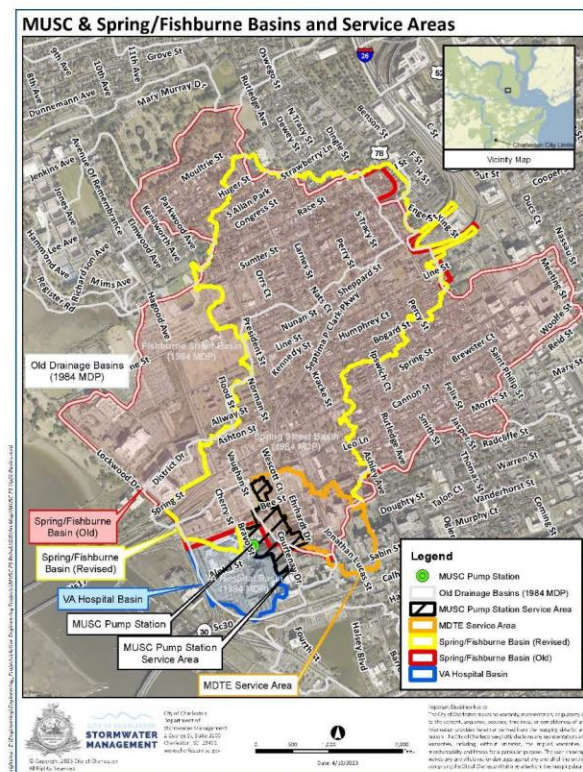


Figure 1. MUSC PS project area and associated drainage basins

The MUSC stormwater PS is located at the northeast corner of the intersection of Bravo Street and Ralph H. Johnson Drive, adjacent to the MUSC Wellness Center and across the street from the Veterans Administration Medical Center (VAMC) (Figure 2). The PS was built in 2007 as part of hospital facility construction and was subsequently transferred to the City to operate and maintain. The PS serves an approximately 12-acre, highly developed and largely impervious drainage basin. The PS houses three 3,000-gallons-per-minute (gpm) pumps, for a combined peak discharge rate of approximately 22,500 gpm (50 cubic feet per second; 32 million gallons

per day). The pumps have been damaged by cavitation and corrosion repeatedly and are approaching the end of their initial design life and now require rehabilitation and replacement. Proposed improvements to the PS include increased pumping capacity, improved hydraulic configuration in the wet well and inflow chamber, enclosure and conditioning of the control room, and replacement and upgrade of electrical, instrumentation and controls, and lighting. At this time, several pump models are being evaluated with the highest capacity pumps being considered for installation resulting in an approximately two-fold increase in the rate of discharge from the system.

In addition to some upstream improvements at the PS, effects of upfitting the MUSC PS will be modified by another project occurring downstream between the force main (FM) exiting the PS and the outfall at the Ashley River. Just upstream of the PS, the proposed project will include replacement or upsizing of two short inflow pipes at the wet well to improve inflow which has been compromised since initial construction. From the PS downstream, a 30-in FM pipe is reduced down to a 24-in pipe as it travels down Bravo Street towards McClennan Banks Drive. The FM enters the VAMC property near the last driveway entrance at the south end of Bravo Street. The pipe cuts across the VAMC campus, outlets into a box culvert under Lockwood Blvd, and discharges into the Ashley River on the south side of the Hilton Garden Inn. This FM on the VAMC property will be demolished and relocated by the VAMC's engineer as part of an upcoming VAMC construction and drainage project. The VAMC project includes a new PS at the south end of the VAMC parking lot and diversion of the new FM into a new outfall to the Ashley River on the southern side of the marina parking lot. The VAMC project is also finalizing plans to upsize the relocated FM extending between the FM from the MUSC PS to the outfall at the Ashley River from a 24-in pipe to a 42-in pipe. In relation to these expected downstream changes, stormwater modeling has demonstrated no significant increase in performance of the PS by upsizing the FM exiting the PS. As such, the proposed action does not include upsizing the 30-in FM exiting the MUSC PS.

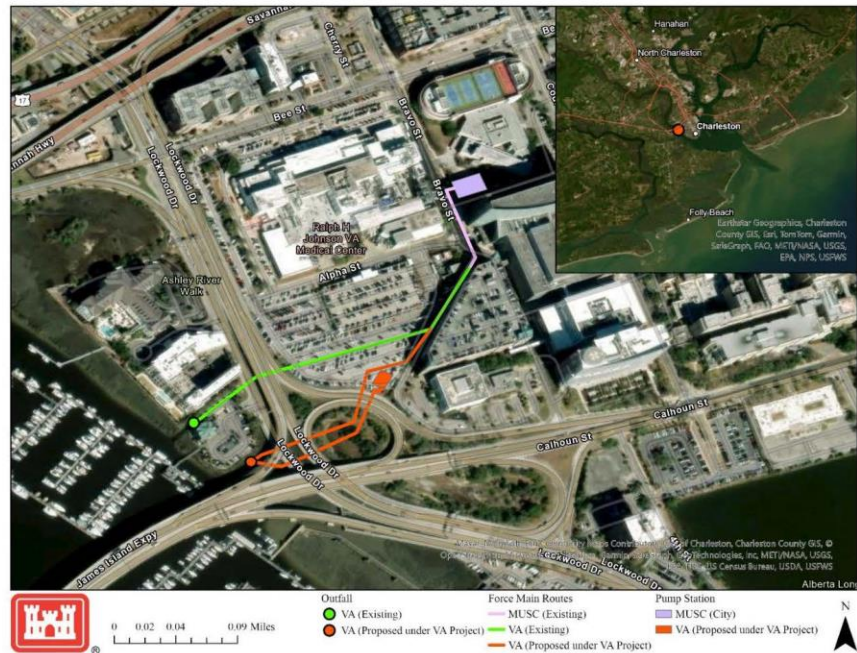


Figure 2. Location of PS in association with existing FM and FM routes proposed under VA-led project.

Potentially Affected NMFS ESA-Listed Species and Critical Habitat

USACE has assessed the listed species that may be present in the action area and our determination of the project's potential effects to them (Table 1). No critical habitats overlap with the action area.

Table 1. ESA-listed species in the action area and effect determinations

Species	ESA Listing Status ¹	Listing Rule/Date ¹	Most Recent Recovery Plan/Outline Date	Effect Determination ¹
Atlantic sturgeon ²	T/E	77 FR 5880 77 FR 5914 February 6, 2012	March 2018	NLAA
Shortnose sturgeon	E	32 FR 4001 March 11, 1967	December 1998	NLAA
Giant Manta Ray	T	83 FR 2916 January 22, 2018	December 2019	NLAA
Green Sea Turtle ³	T	81 FR 20057 April 6, 2016	October 1991	NLAA
Kemp's Ridley Sea Turtle	E	35 FR 18319 December 2, 1970	September 2011	NLAA
Loggerhead Sea Turtle ⁴	T	76 FR 58868 September 22, 2011	December 2008	NLAA

¹Abbreviations include: T = threatened, E = endangered, FR = federal register, NLAA = not likely to adversely affect

²Consisting of South Atlantic and Carolina Distinct Population Segments

³Consisting of North Atlantic DPS

⁴Consisting of Northwest Atlantic Ocean DPS

Effects of the Action

General Impacts to Aquatic Habitat

Project impacts would primarily be limited to effects associated with pump operation and increased capacity directed towards the outfall at the Ashley River following high systemic inputs from storm events. These conditions would be relative to current operation of the pump and existing pump infrastructure. Knott and Martore (1991) documented impacts of Hurricane Hugo on benthic fauna and nekton in the Ashley River and Charleston Harbor and noted declines in dissolved oxygen (DO) levels and salinity associated with influx of stormwater contents (i.e. freshwater precipitation, sediment runoff, septic and sewage failure, etc) into the waterways led to (1) displacement of motile estuarine fauna from upstream habitats to those seaward where salinity was less impacted, (2) die-offs of estuarine fauna where DO decreased substantially, (3) and post-storm recolonization by opportunistic species which are more tolerable of conditions of low DO and salinity levels. By increasing the capacity of pumps to convey stormwater downstream, stormwater would be removed from the surface in smaller time intervals, limiting potential damage to infrastructure, leaching of contaminants, and suspension of debris into stormwater which may occur because of accumulated and prolonged flooding. Sediment, debris, and contaminants which become suspended in unabated floodwaters at point and nonpoint sources are primarily what affect DO levels following a storm event, which Knott and Martore (1991) demonstrated led to aquatic faunal die-offs. Increasing the capacity for stormwater conveyance downstream would also reduce time intervals of saline water displacement, limiting corresponding periods of faunal displacement.

Installation of higher power pumps could lead to localized impacts at the outfall into the Ashley River with the shorter durations in which the total volume of stormwater would be output (i.e. more extensive stormwater input boundary, broader density stratification). However, relative to these impacts from operation of the existing pumps, the proposed upsized pumps would operate on a less frequent basis as pump operation would not occur until depths in the wet well exceeded a relatively greater volume. These impacts would also generally occur alongside similar impacts caused by storm events like those from Hugo as described by Knott and Martore (1991) (i.e. contamination, reduced DO and salinity levels) which would be of a much greater relative scale. Additionally, the reduced frequency and duration of stormwater inputs into the river associated with greater capacity pumps would likely result in net benefits for estuarine fauna following the temporary disturbances.

Atlantic and Shortnose Sturgeon

The two federally protected fish species that commonly occur in or near the project area, particularly the Charleston Harbor, are the shortnose sturgeon and Atlantic sturgeon. Like the Atlantic sturgeon, shortnose sturgeon are anadromous, migrating up rivers from the ocean to spawn. However, shortnose sturgeon spend most of their time as adults in fresh and brackish waters of their natal rivers and rarely venture into lower coastal reaches and the ocean (SCDNR 2020a, NMFS 2024b). In contrast, Atlantic sturgeon primarily occupy nearshore coastal waters from late fall to early summer and returns to natal rivers to spawn between summer and fall (Wirgin et al. 2002, NMFS 2024a). It is primarily during this overwintering period (i.e.

December through late April) Atlantic sturgeon adults and subadults may be the in project area (NMFS 2023a).

Although both species have been detected in the Ashley River, most sturgeon which might occur in the river are likely to be juveniles and transient adults of Atlantic sturgeon (personal communication, Bill Post, SCDNR Diadromous Fish Coordinator). Shortnose sturgeon are currently found in the Cooper River, and the Carolina Distinct Population Segment (DPS) of Atlantic sturgeon is found throughout the Charleston Harbor, with portions of the Cooper River designated as critical habitat for the Atlantic sturgeon. Telemetry studies done by SCDNR of shortnose and Atlantic sturgeon confirm movement throughout the Charleston Harbor, and in the Cooper River with the highest usage of the Cooper River by shortnose sturgeon where the freshwater-to-saltwater interface occurs upstream of the project area.

Atlantic sturgeon are bottom feeders and in South Carolina are known to forage on invertebrate worms (mostly polychaetes), amphipods and mayfly larvae (SCDNR 2020b), but more broadly on crustaceans, mollusks, and even small fish (NMFS 2024a). Likewise, shortnose sturgeon feed along sandy, muddy river bottoms on similar prey (NMFS 2024b). Historically, over-fishing affected sturgeon populations, but current threats to these species include habitat loss or fragmentation, dredging, migration/passage barriers, decreased water quality, and entanglement in fishing gear, as well as vessel strikes for Atlantic sturgeon (NMFS 2024a, NMFS 2024b).

Increased pump capacities would generally lead to higher intensity effects to localized water quality in boundary layers extending further into estuarine reaches of the Ashley River. However, this would also decrease the duration of effects to water quality from storm events relative to current pump capacities. This would increase the intensity but shorten the duration of disturbance in water quality of habitat used by sturgeon for overwintering, migrating, and foraging. These altered conditions would extend into a small proportion of the river and would be avoidable for any sturgeon which may be present in the Ashley River. Collectively, effects are expected to be essentially neutral or even beneficial.

[Giant Manta Ray](#)

Giant manta rays are found in tropical, subtropical and temperate water globally, often offshore and near coastlines including estuarine waters near inlets, bays, tidal outflows, and river mouths (feeding around outfall plumes) (Adams and Amesbury 1998; Pate and Marshall 2020; Farmer et al. 2022). The species generally prefers areas where its primary prey source of zooplankton is abundant, though the species also consumes small and moderate size fishes and shrimp (Burgess et al. 2016; Stewart et al. 2016). Various life stages of ray may occur within Charleston Harbor, and the Ashley and Cooper Rivers foraging and even with the harbor serving as nursing grounds when waters are warmer (White and Potter 2004; Cerutti-Pereyra et al. 2014).

The primary prey of giant manta ray inside the harbor and estuarine environment, zooplankton, are highly influenced by spatiotemporal variations in hydrochemical and physical factors (Bianchi et al. 2003; Sridhar et al. 2006) and may serve as biological indicators of water quality (Hwang et al. 2010). The distribution and abundance of zooplankton in estuarine environments is predominately influenced by salinity (Hwang et al. 2010), while other factors like industrial and

domestic effluents and suspended particulate matter have impacts to zooplankton (Bianchi et al. 2003; Cornils et al. 2005).

As stated above, increased pump capacities would have higher intensity effects to localized water quality in boundary layers extending further into estuarine reaches of the Ashley River. However, these effects would decrease the duration of effects to water quality from storm events relative to current pump capacities. It is expected that effects to giant manta ray would occur indirectly from impacts to prey and foraging habitat available in the Ashley River. These could include impacts to water quality that affect zooplankton communities. However, these impacts are expected to be net neutral given the relationship between duration and intensity and resulting magnitude being relatively equal.

Sea Turtles

Loggerhead sea turtles, green sea turtles and Kemp's ridley sea turtles are all turtles known to primarily occupy neritic (nearshore) habitats (Lamont and Iverson 2018) which may include those in or near the Ashley River and Charleston Harbor. Although there are instances of green sea turtles and loggerhead sea turtles overwintering in some inshore habitats in warmer waters of Florida, turtles will migrate south to warmer waters when inshore waters cool during winter periods (Van Dolah and Maier 1993; Lamont and Iverson 2018). In South Carolina's nearshore waters these turtles are most often observed April through November or nesting on beaches from May through October (SCDNR 2014). Among them, loggerhead sea turtles are the most common species in South Carolina waters (Van Dolah and Maier 1993).

Threats to sea turtles include vessel strikes, dredging, fishing by-catch and entanglement, degradation of foraging habitat, pollution, and disease (SCDNR 2014). They are also threatened by various natural and anthropogenic impacts to their nesting habitat, such as beach erosion, beach armoring, artificial lighting, and nest predation.

Effects of this project on sea turtles could occur indirectly through changes in water quality in habitat used by the species. Loggerhead sea turtles and Kemp's Ridley sea turtles are carnivorous preferring benthic fauna such as whelks, crustaceans, and conch, while green sea turtles are herbivores which consume primarily seagrass and algae (SCDNR 2014). These impacts are likely to have more impacts to benthic foraging species like loggerhead sea turtles inshore in South Carolina, as habitat is considered of low relative value/density already for green sea turtle (NMFS 2023b). Nevertheless, recommendations for protection of green sea turtle habitats would apply to that for other species, which includes preventing degradation (due to contamination and/or loss of food sources) and improving water quality (resulting from industrial pollution, channel dredging and maintenance, harbor activities, farm runoff, sewage disposal, etc.) (NMFS 2023b).

As stated above, increased pump capacities would have higher intensity effects to localized water quality in boundary layers extending further into estuarine reaches of the Ashley River. However, these effects would decrease the duration of effects to water quality from storm events relative to current pump capacities. Effects could include some impact on the water quality of habitat used by sea turtles for migrating, resting, and foraging. These altered conditions would extend into a small proportion of the river and would be avoidable by sea turtles which may be

present in the Ashley River. Collectively, effects are expected to be essentially neutral or even beneficial.

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From: [Charleston Regulatory, FW4](#)
To: [Brown, Niko R CIV USARMY CESAC \(USA\)](#)
Cc: [JohnsonHughes, Christy](#)
Subject: [Non-DoD Source] Re: [EXTERNAL] FW: MUSC Pumphouse Upfitting project - USACE Request for USFWS Informal Consultation - 23MAY24
Date: Tuesday, July 9, 2024 1:27:47 PM

FWS Project Code: 2024-0094925

The U.S. Fish and Wildlife Service has reviewed the MUSC Pumphouse Upfitting Project, in Charleston County, South Carolina. You have requested that the Service provide concurrence or comments regarding potential impacts to federally listed species in accordance with requirements set forth under section 7 of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq. (ESA).

Your agency has made a determination of may affect, but is not likely to adversely affect for West Indian manatee (*Trichechus manatus*). Based on the justification provided, the Service concurs with your determination. Please note that obligations under section 7 of the ESA should be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner, which was not considered in this assessment; or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

T

he Service recommends that you contact the South Carolina Department of Natural Resources regarding potential impacts to State protected species. This email will serve as our official response. Please let me know if you have any questions.

Melanie

From: Brown, Niko R CIV USARMY CESAC (USA) <Niko.R.Brown@usace.army.mil>
Sent: Thursday, May 23, 2024 12:25 PM
To: Charleston Regulatory, FW4 <charleston_regulatory@fws.gov>
Subject: [EXTERNAL] FW: MUSC Pumphouse Upfitting project - USACE Request for USFWS Informal Consultation - 23MAY24

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

My apologies for excluding this from my initial email... project code from IPaC is 2024-0094925.

Please confirm receipt.



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, CHARLESTON DISTRICT
69A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

May 23, 2024

Christy Johnson-Hughes
Ecological Services, South Carolina Field Office
U.S. Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, SC 29407

Dear Christy Johnson-Hughes:

The U.S. Army Corps of Engineers (USACE), Charleston District, proposes to fund the Medical University of South Carolina (MUSC) Pumphouse Upfitting project as described in the attachment to this letter. We request initiation of informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) for the proposed project. Based on analysis of potential project effects, USACE has made a determination of *may affect, not likely to adversely affect* for an ESA-listed species. Our supporting analysis attached. We request your written concurrence with our determinations.

Pursuant to our request for informal consultation, we are providing the following information:

- A description of the action to be considered;
- A description of the action area;
- A description of any listed species or critical habitat that may be affected by the action; and
- An analysis of the potential routes of effect on any listed species or critical habitat.

USACE has reviewed the proposed project for its potential effects to ESA-listed species and their critical habitat. Based on the attached analysis, USACE has made a determination of *may affect, not likely to adversely affect* for the West Indian manatee. We request your concurrence with this determination.

If you have questions, please do not hesitate to contact Mr. Niko Brown, Biologist at niko.r.brown@usace.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "N. Parrish", is located below the "Sincerely," text.

Nancy Parrish,
Chief of Planning and Environmental Branch

Encl

Description of Federal Action

The Medical University of South Carolina (MUSC) stormwater pump station (PS), located on the Charleston Peninsula, is critical infrastructure for the City of Charleston (City) (Figure 1). The MUSC drainage basin forms a topographic low point without a natural outlet, and the PS is required in order to facilitate drainage. The MUSC basin was previously assessed under a task order and the pumping capacity was determined to be insufficient to meet the City's desired level of service (10-yr storm). Additionally, the PS facility and pumps were assessed and improvements were recommended.

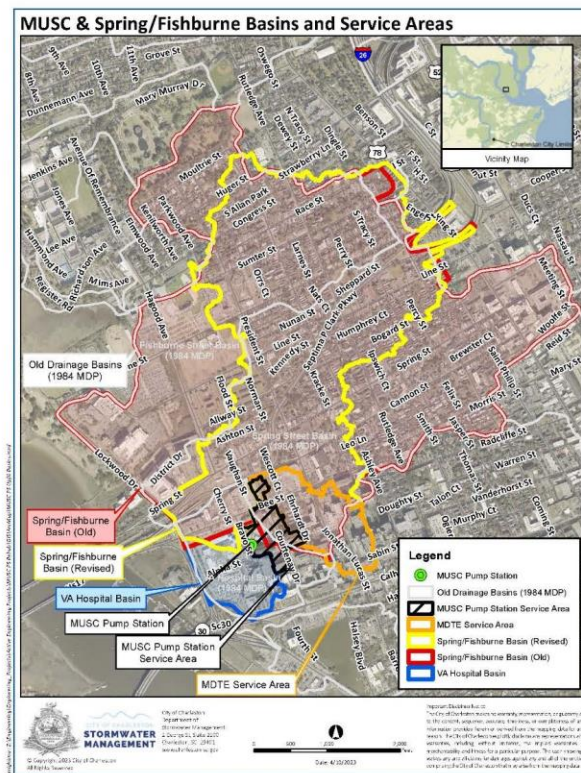


Figure 1. MUSC PS project area and associated drainage basins

The MUSC stormwater PS is located at the northeast corner of the intersection of Bravo Street and Ralph H. Johnson Drive, adjacent to the MUSC Wellness Center and across the street from the Veterans Administration (VA) Medical Center (VAMC) (Figure 2). The PS was built in 2007 as part of hospital facility construction and was subsequently transferred to the City to operate and maintain. The PS serves an approximately 12-acre, highly developed and largely impervious

drainage basin. The PS houses three 3,000 gallons per minute (gpm) pumps, for a combined peak discharge rate of approximately 22,500 gpm (50 cubic feet per second [cfs]; 32 million gallons per day [MGD]). The pumps have been damaged by cavitation and corrosion repeatedly and is approaching the end of its initial design life and the pumps and equipment require rehabilitation and replacement. Proposed improvements to the PS include increased pumping capacity, improved hydraulic configuration in the wet well and inflow chamber, enclosure and conditioning of the control room, and replacement and upgrade of electrical, instrumentation and controls, and lighting. At this time, several pump models are being evaluated with the highest capacity pumps being considered for installation resulting in an approximately two-fold increase in cfs from the system.

In addition to some upstream improvements at the PS, effects of upfitting the MUSC PS will be modified by another project occurring downstream between the FM exiting the PS and the outfall at the Ashley River. Just upstream of the PS, the proposed project will include replacement or upsizing of two short inflow pipes at the wet well to improve inflow which has been compromised since initial construction. From the PS downstream, a 30-in force main (FM) pipe is reduced down to a 24-in pipe as it travels down Bravo Street towards McClennan Banks Drive. The FM enters the Veteran Affairs (VA) property approximately at the last driveway entrance at the south end of Bravo Street. The pipe cuts across the VA campus, outlets into a box culvert under Lockwood Blvd, and discharges into the Ashley River on the south side of the Hilton Garden Inn. This FM on the VA property will be demolished and relocated by the VA's engineer as part of an upcoming VA Medical Center (VAMC) construction and drainage project which includes a new PS at the south end of the VAMC parking lot and diversion of the new FM into a new outfall to the Ashley River on the southern side of the marina parking lot. The VAMC project is also finalizing plans to upsize the relocated FM extending between the FM from the MUSC PS to the outfall at the Ashley River from a 24-in pipe to a 42-in pipe. In relation to these expected downstream changes, stormwater modeling has demonstrated no significant increase in performance of the PS by upsizing the FM exiting the PS. As so, the proposed action does not include upsizing the 30-in FM exiting the MUSC PS.

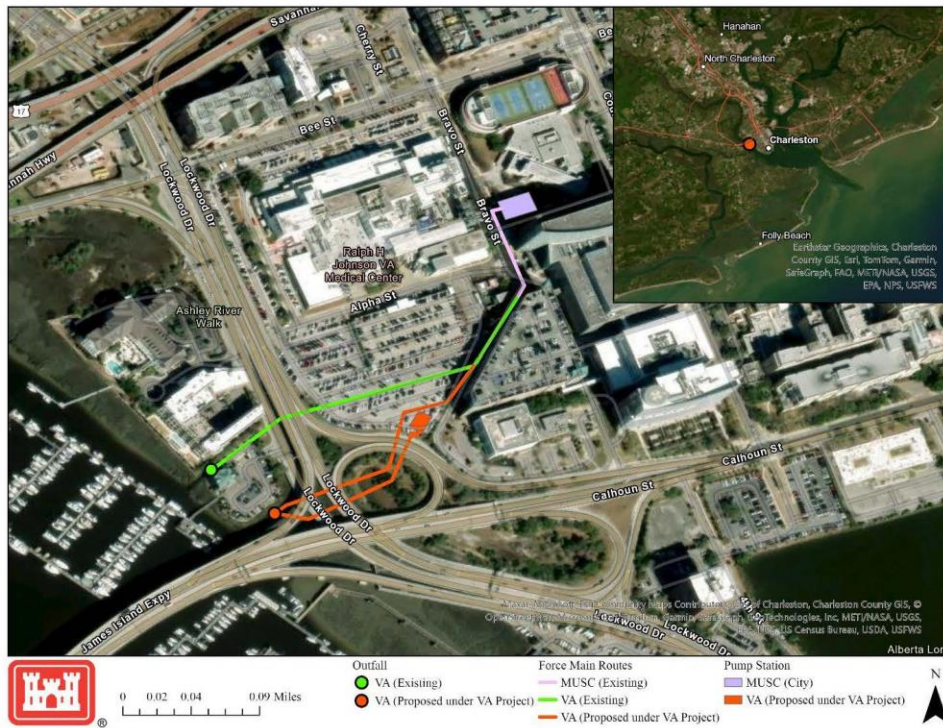


Figure 2. Location of PS in association with existing FM and FM routes proposed under VA-led project

Species Assessment and Effect Determination

On 25 April 2024, USACE obtained a comprehensive list of threatened and endangered species occurring in the project area from USFWS. The list includes 15 species and no critical habitat designations (Table 1).

Table 1 List of federally designated threatened and endangered species under ESA present in project area as determined by USFWS

Common Name	Scientific Name	Listing ¹	Species Determination ²
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	E	NE
Tricolored Bat	<i>Perimyotis subflavus</i>	PE	NE
West Indian Manatee	<i>Trichechus manatus</i>	T	MANLAA
Eastern Black Rail	<i>Laterallus jamaicensis ssp. jamaicensis</i>	T	NE
Piping Plover	<i>Charadrius melodus</i>	T	NE
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	NE
Rufa Red Knot	<i>Calidris canutus rufa</i>	T	NE
Wood Stork	<i>Mycteria americana</i>	T	NE
Green Sea Turtle	<i>Chelonia mydas</i>	T	NE
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E	NE
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	NE
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T	NE
American Chaffseed	<i>Schwalbea americana</i>	E	NE
Canby's Dropwort	<i>Oxypolis canbyi</i>	E	NE
Pondberry	<i>Lindera melissifolia</i>	E	NE

¹Species are designated as either "T" if listed threatened, "E" if listed as endangered or "PE" if listed as proposed endangered

²Determinations are designated as either "NE" for *no effect* or "MANLAA" for *may affect, not likely to adversely affect*

Upon review, USACE made a determination of *may affect, but not likely to adversely affect* for the West Indian manatee. A *no effect* determination was made for all other listed species under consideration.

General Impacts to Aquatic Habitat

Project impacts would primarily be limited to effects associated with pump operation and increased capacity directed towards the outfall at the Ashley River following high systemic inputs from storm events. These conditions would be relative to current operation of the pump and existing pump infrastructure. Knott and Martore (1991) documented impacts of Hurricane Hugo on benthic fauna and nekton in the Ashley River and Charleston Harbor and noted declines in dissolved oxygen (DO) levels and salinity associated with influx of stormwater contents (i.e. freshwater precipitation, sediment runoff, septic and sewage failure, etc) into the waterways led to (1) displacement of motile estuarine fauna from upstream habitats to those seaward where salinity was less impacted, (2) die-offs of estuarine fauna where DO decreased substantially, (3) and post-storm recolonization by opportunistic species which are more tolerable of conditions of low DO and salinity levels. By increasing the capacity of pumps to convey stormwater downstream, stormwater would be removed from the surface in smaller time intervals, limiting potential damage to infrastructure, leaching of contaminants, and suspension of debris into stormwater which may occur because of accumulated and prolonged flooding. Sediment, debris, and contaminants which become suspended in unabated floodwaters at point and nonpoint sources are primarily what affect DO levels following a storm event, which Knott and Martore (1991) demonstrated led to aquatic faunal die-offs. Increasing the capacity for stormwater conveyance downstream would also reduce time intervals of saline water displacement, limiting corresponding periods of faunal displacement.

Installation of higher power pumps could lead to localized impacts at the outfall into the Ashley River with the shorter durations in which the total volume of stormwater would be output (i.e. more extensive stormwater input boundary, broader density stratification). However, relative to these impacts from operation of the existing pumps, the proposed upsized pumps would operate on a less frequent basis as pump operation would not occur until depths in the wet well exceeded

a relatively greater volume. These impacts would also generally occur alongside similar impacts caused by storm events like those from Hugo as described by Knott and Martore (1991) (i.e. contamination, reduced DO and salinity levels) which would be of a much greater relative scale. Additionally, the reduced frequency and duration of stormwater inputs into the river associated with greater capacity pumps would likely result in net benefits for estuarine fauna following the temporary disturbances.

West Indian Manatee

During warm summer months, manatees migrate into South Carolina's rivers, bays and estuaries such as the Ashley River and nearby waters. The species is attracted to warm water outfalls and access to beds of *Spartina alterniflora* at high tide (SCDNR 2014). Marsh habitat with abundant stands of *Spartina* line the Ashley River both upstream and downstream of the outfall associated with this project. Any impacts to water quality associated with increased capacity at the pumphouse could have indirect impacts to wetland habitat quality used by manatee. However, given the scale of this change in output capacity is limited and small in magnitude relative to those similar impacts which would occur as a result of storm activity described by Knott and Martore (1991), potential impacts from this project are expected to be insignificant.

Summary

USACE has made a determination of *may affect, not likely to adversely affect* for West Indian Manatee from the implementation of the proposed action. The proposed Federal action will have no effect on the remaining species in Table 1.

In accordance with Section 7 of the ESA, USACE requests concurrence with the above determinations. Please provide your response and/or comments within 60 calendar days of receipt of this letter.

Literature Cited

- Knott, D. M., and R. M. Martore. 1991. The Short-Term Effects of Hurricane Hugo on Fishes and Decapod Crustaceans in the Ashley River and Adjacent Marsh Creeks, South Carolina. *Journal of Coastal Research* 8:335–356.
- South Carolina Department of Natural Resources [SCDNR]. 2014. South Carolina's State Wildlife Action Plan (SWAP), 2015, Supplemental Volume: Species of Conservation Concern, Florida Manatee, *Trichechus manatus latirostris*. South Carolina Department of Natural Resources, Columbia, SC, USA.

**Appendix C CWA Section 401 and 404
Compliance Record**

From: [Ress, Logan D.](#)
To: [Brown, Niko R CIV USARMY CESAC \(USA\)](#)
Cc: [Shirey, Alan D CIV USARMY CESAC \(USA\)](#); [Parrish, Nancy A CIV USARMY CESAC \(USA\)](#)
Subject: [Non-DoD Source] Re: 401 WQC for Pump Station Upfitting
Date: Tuesday, April 30, 2024 2:54:18 PM

Good afternoon Niko,

I apologize for the delay in my response, but I wanted to check with my manager to make sure that my thoughts on this were correct. Given that there is no discharge of fill material into/excavation of waters of the US, no 401 Water Quality Certification will be needed.

Please let me know if you have any other questions.

Thanks,

Logan

Logan Ress
Project Manager
Water Quality Certification and Wetland Section
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4333
Connect: www.scdhec.gov [Facebook](#) [Twitter](#)

From: Brown, Niko R CIV USARMY CESAC (USA) <Niko.R.Brown@usace.army.mil>
Sent: Thursday, April 25, 2024 3:33 PM
To: Ress, Logan D. <ressld@dhec.sc.gov>
Cc: Shirey, Alan D CIV USARMY CESAC (USA) <Alan.D.Shirey@usace.army.mil>; Parrish, Nancy A CIV USARMY CESAC (USA) <Nancy.A.Parrish@usace.army.mil>
Subject: RE: 401 WQC for Pump Station Upfitting

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Logan,

Thanks for the quick turnaround! I have attached an unsigned application... I can get it signed and formalized once we are more sure of what the most appropriate way to fill it out is... (I am basically just unsure of how wetland impacts are quantified in the application as they apply here). I can try to get together any other materials you think may be helpful, but these are the ones I think should provide the most useful information at the moment.

Best,

Niko Brown
Biologist, Planning & Environmental Branch
USACE – Charleston District
O: (843) 329-8145

From: Ress, Logan D. <ressld@dhec.sc.gov>
Sent: Thursday, April 25, 2024 1:56 PM

To: Brown, Niko R CIV USARMY CESAC (USA) <Niko.R.Brown@usace.army.mil>
Cc: Hightower, Charles <HIGHTOCW@dhec.sc.gov>; Hicks, Shannon <Hickss@dhec.sc.gov>; Stout, Christopher <stoutcm@dhec.sc.gov>
Subject: [Non-DoD Source] Re: 401 WQC for Pump Station Upfitting

Good afternoon Niko,
Would you be able to send me the application or any supplemental material that you have for the project? I will look it over, and then we can discuss how best to move forward.
Thanks,
Logan

Logan Ress
Project Manager
Water Quality Certification and Wetland Section
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4333
Connect: www.scdhec.gov [Facebook](#) [Twitter](#)

From: Brown, Niko R CIV USARMY CESAC (USA) <Niko.R.Brown@usace.army.mil>
Sent: Thursday, April 25, 2024 11:00 AM
To: Ress, Logan D. <ressld@dhec.sc.gov>
Cc: Hightower, Charles <HIGHTOCW@dhec.sc.gov>; Hicks, Shannon <Hickss@dhec.sc.gov>; Stout, Christopher <stoutcm@dhec.sc.gov>
Subject: 401 WQC for Pump Station Upfitting

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***
Hi Logan,

I wanted to reach out to see if you could provide me some direction on how to proceed with 401 compliance on one of our USACE SAC projects with the City of Charleston. The City is planning to upfit a pump station in downtown to increase performance and output in the Spring-Fishburne drainage basin. Essentially, this would involve replacing some dated pump infrastructure including the pumps themselves and upfitting some force mains downstream to accommodate greater output. This would lead to close to a doubling of the capacity of output which drains into an outfall along the Ashley River off Lockwood Dr.

It is not clear to me whether there is a NWP that would apply here or if it would require a 401 at all. You'll have to forgive me, as Section 401 is not my specialty. I can try to provide greater detail if it helps and my intent in reaching out to you now is to start coordinating the matter as early as possible.

I very much appreciate your time. Please feel free to give me a call at my desk at (843) 329-8145, or on my cell at (603) 562-9840.

Thank you very much!

**Appendix D Magnuson-Stevens Fishery and
Conservation Act Compliance Record**


Brown, Niko R CIV USARMY CESAC (USA)

From: Jordan Wolfe - NOAA Federal <jordan.wolfe@noaa.gov>
Sent: Tuesday, May 7, 2024 1:59 PM
To: Brown, Niko R CIV USARMY CESAC (USA); Pace Wilber - NOAA Federal
Subject: [Non-DoD Source] Re: MUSC Pumphouse Upfitting Project - Charleston Downtown

Hey Niko,

Thank you for sending this along. We reviewed the proposed project area, and the NMFS confirms that the proposed work would occur within or near essential fish habitat (EFH), but we anticipate any adverse effects occurring from the project to NOAA-trust resources would be minimal. Consequently, the NMFS offers no EFH conservation recommendations pursuant to the Magnuson-Stevens Fishery Conservation and Management Act and no recommendations under the Fish and Wildlife Coordination Act.

Holler if you have any questions!

 Jordy Wolfe

Fish Biologist

Habitat Conservation Division, Atlantic Branch

NOAA Fisheries

331 Ft. Johnson Road

Charleston, SC 29412

O: (843) 560-9532

C: (843) 697-7317

jordan.wolfe@noaa.gov

On Tue, Apr 30, 2024 at 4:06 PM Brown, Niko R CIV USARMY CESAC (USA) <Niko.R.Brown@usace.army.mil> wrote:

Hey Jordan,

I've got another project in the pipeline that we are getting to a 35% design on in downtown Charleston. The need for an EFH assessment and formal consultation is sort of debatable with this one, so I wanted to reach out now and let NMFS know what we know so far.

Essentially, there is a stormwater pump the City is working with their contracting A&E to design as the current model struggles to keep up with the increased needs and as it ages. The A&E is currently evaluating several pump alternatives which would increase the flow rate of stormwater output through the current stormwater system from about 50 cfs to about 100 cfs. In the figure below, you can see where the MUSC pumphouse is and the force main route to its outfall on the Ashley River. Its possible in the future, the City may decide to upsize the force main for the first 350 ft from the MUSC pumphouse to accommodate greater output, but the remainder of that force main and any outfall changes would occur under a different project by the VA since they own everything beyond that 350 ft.

Basically, the only real effects of the project proposed is an increase in the flow rate through the system for the purpose of offsetting urban flooding. To me, this should have generally beneficial impacts as its less time for contaminants, damaged infrastructure, and debris to infiltrate stormwater that gets carried to the outfall. The only caveat is that the forces at the outfall would be increased during this period. To what degree those limited duration effects are adverse for EFH is where I am hung up. I would expect some potential for more bed scour, water velocity, and a greater concentration of freshwater input. However, I don't really see this having really adverse consequences.

Let me know what you think. If we think we need an EFH assessment, I would probably include it in-text in the EA we are preparing to be shared with NMFS during the public comment period. I welcome any resources you think may be helpful.

Thanks!!!!



Niko Brown

Biologist, Planning & Environmental Branch

USACE – Charleston District

O: (843) 329-8145

Appendix E CZMA Compliance Record



Policy Group XII - Activities in Areas of Special Resource Significance

Project Name: MUSC Pump Station Upfitting Project

TMS: _____

The Agency's Coastal Zone Consistency (CZC) certification review of all activities within the Coastal Zone that require a State permit will be based on the policies contained within the project based checklists. For the CZC request to be complete, you must answer the questions contained within the policies segment relative to your project by checking off all that apply. More than one checklist may apply to your project based on the plan proposal. For example, a road or highway project might also require dredging and filling of coastal wetlands.

A) **Barrier Islands:**

Required: Will your proposed project or plans on a barrier island...

a. <input type="checkbox"/> retain to the extent feasible existing dune ridges, drainage patterns and natural vegetation in landscaping and construction plans in order to maintain the value of the island as a storm buffer? <input type="checkbox"/> or is this N/A?
b. <input type="checkbox"/> demonstrate reasonable precautions to prevent or limit any direct negative impacts on the adjacent critical areas (beaches, primary dunes, coastal waters and wetlands) because of their proximity to and strong ecological relationship with the critical areas of the coastal zone? <input type="checkbox"/> or is this N/A?
c. <input type="checkbox"/> avoid new road or bridge projects involving the expenditure of public funds to provide access to previously undeveloped barrier islands unless an overwhelming public interest can be demonstrated such as access to a public recreation area or facility? <input type="checkbox"/> or is this N/A?
d. <input type="checkbox"/> include the extension of public services, such as sewer and water facilities that are proposed in a comprehensive approach, which considers the natural "carrying capacity" of the island to support development and which integrates these facilities to parallel the level of access which is available to the island? <input type="checkbox"/> or is this N/A?
e. <input type="checkbox"/> include any efforts to acquire portions of the barrier island for inclusion in preservation and protection programs? <input type="checkbox"/> or is this N/A?
f. <input type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage? <input type="checkbox"/> or is this N/A?

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

Signature and date

B. Dune Areas:

Required: Will your proposed project or plans in dune areas...

a.	<input type="checkbox"/> demonstrate reasonable precautions to prevent or limit any direct negative impacts on the adjacent critical areas because of proximity to and strong physical and ecological relationship with the beach and primary sand dune critical areas of the coastal zone? <input type="checkbox"/> or is this N/A?
b.	<input type="checkbox"/> prevent or mitigate negative impacts on adjacent property owners, specifically, increased erosion or loss of protective dune formations on adjacent lots due to unnecessary destruction of or encroachment onto stable dunes? <input type="checkbox"/> or is this N/A?
c.	<input type="checkbox"/> be consistent with the policies of the Beach Erosion, and Beach and Shoreline Access sections (Chapter IV - 41) of the CZMP, as well as other applicable Resource Policies? <input type="checkbox"/> or is this N/A?
d.	<input type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage? <input type="checkbox"/> or is this N/A?

Recommended policies to consider in designing impoundments:

- a. *Local governments with coastal shorefronts are encouraged to develop and implement strong local zoning and building ordinances for beach and sand dune areas.*
- b. *Property owners, development interests and local governments are encouraged to institute and observe set-backs or buffer zones for construction in beach and dune areas.*

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

Signature and date

C. Navigational Channels

Required: Will your proposed project or plans in navigable channels...

a.	<input checked="" type="checkbox"/> avoid losses to existing navigability? <input type="checkbox"/> or is this N/A?
b.	<input type="checkbox"/> utilizes best mitigation measures feasible for development which might increase upland soil and shoreline erosion problems and resulting siltation of navigation channels? <input checked="" type="checkbox"/> or is this N/A?
c.	<input checked="" type="checkbox"/> avoid interfering with commercial navigation in designated shipping channels? <input type="checkbox"/> or is this N/A?
d.	<input type="checkbox"/> be consistent with the Dredging and Dredge Material Disposal policies contained within the CZMP? <input checked="" type="checkbox"/> or is this N/A?
e.	<input checked="" type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage? <input type="checkbox"/> or is this N/A?

Required:

On an attached sheet, briefly summarize how your project is consistent with the policies of the South Carolina Coastal Zone Management Program listed above.

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that my project is consistent with the South Carolina Coastal Zone Management Program.

BROWN.NIKO.ROBERT.1617428810 Digitally signed by BROWN.NIKO.ROBERT.1617428810
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Signature and date

D. Public Open Spaces (State or Local Parks):

Required: Will your proposed park project or plans...

a.	<input type="checkbox"/> avoid restriction or limitation of the continued use of a recreational open area or disruption of the character of such a natural area (aesthetically or environmentally)? <input type="checkbox"/> or is this N/A?
b.	<input type="checkbox"/> increase the amount and distribution of public open space and recreational areas in the coastal zone? <input type="checkbox"/> or is this N/A?
c.	<input type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage? <input type="checkbox"/> or is this N/A?

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

Signature and date

E. Wetlands:

Required: Will your proposed project or plans...

a.	<input type="checkbox"/> require the fill or other significant permanent alteration of a productive freshwater marsh? If so, does your project demonstrate that no feasible alternative exists or there is an overriding public interest? Explain why there are no feasible alternative exists and what the public interest is in the summary section below.
	<input checked="" type="checkbox"/> or is this N/A?
b.	<input type="checkbox"/> (for filling, ditching, clearing, or excavation of wetlands) demonstrate mitigation sites or practices to offset the losses of wetlands consistent with the Division's Mitigation Guidelines? The types of mitigation include wetland buffers, creation of wetlands, and restoration of existing wetlands, offsite mitigation, and mitigation banking. Provide a summary of mitigation details on an attached document.
	<input checked="" type="checkbox"/> or is this N/A?
c.	<input checked="" type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage?
	<input type="checkbox"/> or is this N/A?

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

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Signature and date



Policy Group XIII - Stormwater Management

Project Name: MUSC PumpStation Upfitting Project
TMS: _____

The Agency's Coastal Zone Consistency (CZC) certification review of all activities within the Coastal Zone that require a State permit will be based on the policies contained within the project based checklists. For the CZC request to be complete, you must answer the questions contained within the policies segment relative to your project by checking off all that apply. More than one checklist may apply to your project based on the plan proposal. For example, a road or highway project might also require dredging and filling of coastal wetlands.

A) Stormwater Runoff Storage – all projects located within one-half (1/2) mile of a receiving water body (not contiguous via an outfall or similar structure with a tidal water body):

Required: Will your proposed development project or plans...

- | |
|---|
| a. <input checked="" type="checkbox"/> demonstrate that storage of the first 1/2 inch of runoff from the entire site or storage of the first one (1) inch of runoff through retention, detention or infiltration systems, from the built-upon portion of the property, whichever is greater? (Storage may be accomplished through retention, detention, or infiltration systems <u>as appropriate</u> for the specific site.) |
| b. <input type="checkbox"/> (for those projects which are located within one thousand feet of shellfish beds) demonstrate the first one and one half (1 1/2) inches of runoff from the built-upon portion of the property be retained on site? |
| c. <input checked="" type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage? |

Non Applicable Policies:

Briefly provide reasons (for non applicability) on a supplemental page and attach to this checklist if any of these questions (policies) do not apply to the project.

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

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B) Golf Courses Adjacent to Receiving Water Bodies:

Required: Will your golf course project or plans...

- | |
|--|
| a. <input type="checkbox"/> incorporate a minimum setback of 20 feet from any receiving water body for all manicured areas of the golf course (fairways, greens and tees) unless other acceptable management techniques are approved and implemented to mitigate any adverse impacts? |
| b. <input type="checkbox"/> demonstrate that all drainage from greens and tees will be routed to interior lagoons or an equivalent stormwater management system? |
| c. <input type="checkbox"/> demonstrate that all outfalls (from any lagoon system) is located at an elevation above the critical area (and if the discharge is to critical area) AND is above the normal water elevation a distance to allow for storage of the first one inch of runoff to prevent the conversion of the stormwater management system to critical area and to maintain positive drainage at high tides? |

d. <input type="checkbox"/> demonstrate the conveyance of all drainage to the interior lagoon system or to an equivalent onsite stormwater management system for all greens and tees proposed to be located on marsh hummocks or islands, if applicable?
e. <input type="checkbox"/> provide for a minimum 20 foot buffer, or an accepted alternative, between manicured areas (fairways, greens and tees) to limit stormwater impacts to freshwater wetlands?
f. <input type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage?
g. <input type="checkbox"/> include an integrated pest management system designed in accordance with current best technology practices on the golf course to limit the application of chemicals which, if over applied, may leach into the ground and adjacent surface waters?
h. <input type="checkbox"/> include a two (2) foot separation between the surface of the golf course and the groundwater table where spray effluent is applied?
i. <input type="checkbox"/> demonstrate that the normal ground water elevation has been established by a registered engineer or soil scientist?
j. <input type="checkbox"/> retain the first 1.5 inches of runoff as otherwise described in Policy Question c. for all projects which are within 1000 feet of shellfish beds?
k. <input type="checkbox"/> demonstrate that in the event spray effluent or chemicals are applied to the turf via the irrigation system, all spray heads are located and set so as to prevent any aerosols from reaching adjacent critical areas?

Non Applicable Policies:

Briefly provide reasons (for non applicability) on a supplemental page and attach to this checklist if any of these questions (policies) do not apply to the project.

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

Signature and date

C) Mine and Landfills:

Required: Will your mine or landfill project or plans (for mines or landfills located within ½ mile of a receiving waterbody)...

a. <input type="checkbox"/> demonstrate that when pumping ground water from sediment basins, only floating intakes are used and that pumping ceases when water levels come to within two feet of the pond bottom?
b. <input type="checkbox"/> be consistent with the Priority of Uses of each listed Geographic Areas of Particular Concern (GAPCs) as discussed in the Geographic Areas of Particular Concern (GAPCs) Policies and Priority of Uses document located on the Resources section of the CZC webpage?

Non Applicable Policies:

Briefly provide reasons (for non applicability) on a supplemental page and attach to this checklist if any of these questions (policies) do not apply to the project.

Required:

As applicant or agent, having completed all appropriate checklists and having read the applicable policies, I certify that this project is consistent with the South Carolina Coastal Zone Management Program based on the information outlined above and supplemental information attached.

Signature and date

**Appendix F Public Comments Received
(Placeholder)**